News of the Industry Begins Page 812

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AUTOMOTIVE INDUSTRIES
VOLUME 56 *Philadelphia, Saturday, May 28, 1927* NUMBER 21

Character of State Automotive Legislation Improving

Review of recent bills passed and considered indicates a trend toward sounder and more intelligent laws affecting industry in future.

By Norman G. Shidle

TRYING to find out exactly what the state legislatures have done this year in the way of automotive legislation is a bit like chasing mercury molecules around in a glass dish. Probably it will be some months yet before a final official tabulation can be made of exactly what has happened. But plenty of activities of interest already have transpired.

The Hoover Uniform Vehicle Code—the recommendations of the National Conference on Street and Highway Safety—has been introduced in whole or in part in the legislatures of 20 or more states, for one thing. Some times it has emerged with its countenance so altered as to be scarcely recognizable by its progenitors, but on the whole it is faring as well as might be expected in the various political prize rings in which the laws of our states are pounded into shape.

Certificate of title laws still seem to be making headway despite the fact that two states, Alabama and South Carolina, have just repealed laws of this type which they previously had in force. New certificate of title laws probably will be passed, however, in several other states so that the total number of commonwealths having laws of this character at the end of 1927 almost certainly will be greater than at the beginning.

Then there is, of course, compulsory insurance. The chances of any more states passing compulsory insurance laws this year seem to be growing dimmer as the weeks go by.

Gasoline taxes have been stepped up sharply in many states and levied for the first time in one other. There has been the usual grist of bills on examination of drivers, reckless driving, headlights, truck and bus weight restrictions, common carrier regulations, traffic rules, etc.

Compulsory automobile liability insurance laws again have failed to make much progress this year, although it cannot be said that there is any tendency on the part of the various state legislatures to forget this type of legislation. Bills urging compulsory insurance have been proposed in at least 25 of the 44 state legislatures holding regular meetings this year and their proponents have met with considerable support in various instances. Most of the legislators, however, seem content for the time being to await the complete and detailed results of the Massachusetts experiment before going further with legislation in their own states.

In an informal discussion of the general state legislative situation which provided much of the information upon which this article is based, representatives of the Motor Vehicle Conference Committee pointed out that the New England states as a whole now offer an excellent laboratory for the study of automobile liability insurance in action. Every New England state, it was shown, now has in effect some sort of automobile liability insurance law although the Massachusetts law is the only one which may properly be called a compulsory liability law.

In Connecticut, it will be remembered, there has been a very much modified form of compulsory insurance law in force since Jan. 1, 1926.

THIS year 44 state legislatures are holding regular meetings and three states already have had special sessions. There will be more special sessions before the year closes.

Over 2600 bills relating to automotive topics already have been before the state legislators, according to the Motor Vehicle Conference Committee, to which organization we are indebted for the information in this article relating to the action taken by the various legislatures and the present status of different automotive bills.

The volume of automotive legislation this year, the M.V.C.C. states, is 10 per cent in excess of that produced in 1925, the last year in which most of the state bodies met.

The Connecticut law provides that the commissioner of motor vehicles may require proof of financial responsibility to satisfy any claim for damages by reason of personal injury or death to any person of at least $10,000 and for damage to property of at least $1000 from a vehicle owner who shall have caused the death or injury of any person or damage to property to the extent of at least $100, or when the owner has been convicted of reckless driving or of driving while intoxicated or of running away from the scene of the accident. If such insurance is not taken out under these circumstances, the commissioner may revoke the owner's license and refuse to issue another.

Since Jan. 1, 1927, three other New England States—Vermont, Maine and Rhode Island—have enacted laws similar in all essential respects to the Connecticut legislation.

New Hampshire this year has enacted into law what is known as the Stone plan. This plan provides in effect that when an automobile accident occurs a preliminary hearing is held by a court. If the court finds the motor vehicle operator responsible for the accident, the driver must take out insurance to cover possible damages which later may be awarded from an ensuing suit brought in the regular way. Should he fail to take out such insurance under these circumstances, his license will be revoked. The obvious objection to this plan, it would appear, is that a driver in such a position might find it difficult to get insurance at a reasonable rate.

As the Motor Vehicle Conference Committee points out, however, we have available for the first time a real experimental laboratory in which to watch the working out of compulsory insurance and the wise thing for state legislatures in general is to sit tight and watch developments.

The fight for certificate of title laws perhaps has occupied as prominent a position as any other single legislative move in the eyes of certain automotive men this year. At the beginning of 1927 the following 21 states had certificates of title laws: Alabama, Arizona, California, Colorado, Delaware, Florida, Indiana, Maryland, Michigan, Mississippi, Missouri, Montana, North Carolina, Oklahoma, Oregon, Pennsylvania, South Dakota, South Carolina, Virginia, West Virginia and Wisconsin. Since the beginning of the year, as already mentioned, Alabama and South Carolina have repealed their certificate of title laws.

From the standpoint of discouraging theft, making identification of cars easier and indirectly of making possible reduction of insurance rates, the value of certificate of title laws seems quite considerable from the standpoint of the automotive manufacturer as well as from that of the general public. The possible reduction

of insurance rates with the consequent lowering of sales resistance is, of course, one of the manufacturers' primary interests in the matter. Opponents of the measures in some states urge that the good results claimed do not always accrue as a result of these laws and particularly that promised reductions in insurance rates have not always materialized.

So far it has been difficult to procure for publication exact and detailed data of insurance experience as regards thefts as related to rates, so that the question of insurance rates, both in connection with certificate of title legislation and in connection with experiences with specific identification methods and locking devices used on individual cars, still is not satisfactorily answered from every angle.

Both the Motor Vehicle Conference Committee, however, and the insurance companies are strongly in favor of the adoption of certificate of title acts and the model for a "Uniform Motor Vehicle Registration and Certificate of Title Act" suggested by the National Conference on Street and Highway Safety is being urged in a number of states this year. Final returns are not yet in but it is almost certain that new laws will be adopted in several states making negligible the setback suffered through loss of the certificate of title acts in Alabama and South Carolina.

Gasoline taxes, another important legislative element from the standpoint of vehicle operating costs, are going up. That trend is very definite. There is absolutely no tendency apparent on the part of the states, moreover, to reduce or eliminate other forms of motor vehicle taxes as they boost the gasoline tax rate. In Massachusetts, where the legislature reduced the passenger car tax to a flat rate of $3 a year when it enacted a new 2c gasoline tax, the bill on this subject was vetoed by Governor Fuller. The legislature in Ohio, also, decreased its passenger car registration fee by about 50 per cent and increased its gasoline tax from 2c to 3c. This bill, however, is in the hands of the governor as we write and there is some possibility, it is understood, that he may veto it.

Generally speaking, however, there has been a general increase in gasoline taxes without any compensating decrease in other special tax levies on motor vehicle operators. Thus far 13 states have increased their gasoline taxes this year, while New Jersy has inaugurated a 2c gasoline tax for the first time.

Following is a list of the increases in gasoline tax that have been made thus far during 1927:

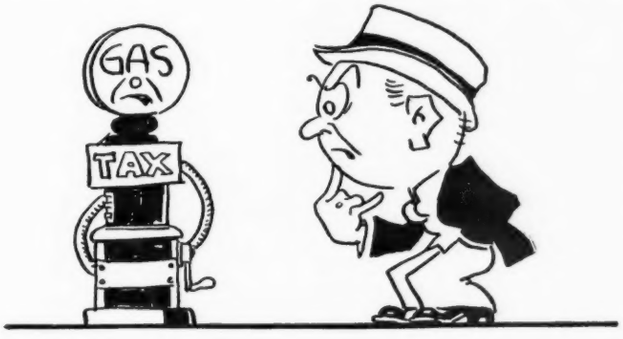
State	Old tax	New tax
Alabama	.02	.04
Arkansas	.04	.05
Idaho	.03	.04
New Mexico	.03	.05
Tennessee	.03	.04
Texas	.01	.03
Wyoming	.02½	.03
Pennsylvania	.02	.03
Delaware	.02	.03
Maryland	.02	.03
Vermont	.02	.03
Colorado	.02	.04
South Dakota	.03	.04

One favorable aspect of the present gasoline tax laws is that the funds resulting from their collection are to be devoted to road construction and maintenance in practically every case. In South Dakota the 1 cent increase goes into a general fund but in other states the motorists will get quite direct benefits through better roads and increased highway mileage.

It is too early by far to attempt any accurate appraisal of how the automotive industry fared in regard to 1927 state legislative action. The details available as regards the few main issues already discussed merely show one or two favorable trends and one or two others not entirely favorable from the standpoint of the manufacturer.

To all of those whose past experience has lead through mazes of legislative activity and political expediency, the progress made by the Uniform Vehicle Code recommended by the Hoover conference appears to be all that might reasonably be expected, if not all that might be hoped for by its well-wishers in the industry. Naturally, each state legislature, into which the provisions of this code have been introduced in whole or in part, may find it necessary to modify certain phases of the proposals better to suit local conditions. This was to be expected in the beginning. Every attempt at modification, of course, opens the way to long debates similar to those gone through at the Washington sessions from which the recommended code itself finally grew.

In any case it seems certain that, having been introduced in more than 20 states this year, the code already is serving materially those ends for which it is designed



—namely the guiding of legislative thought toward the desirability of uniformity in motor vehicle regulations and toward intelligent, constructive legislative effort in regard to the automobile. Some months from now it will be possible to assess with more detailed accuracy just how much of this code has been written into state law in recognizable form.

That the activities of the state legislatures this year have not met with the wishes of motorists in some instances is indicated by perusal of various state automobile club magazines and bulletins. The official organ of the Ohio State Automobile Association for May, for example, carries a headline on its leading story which runs: "Ohio Legislature Performs While the Hopes of Motorists Languish in the Dust and Safety Needs Perish." Objection is made to the refusal by the legislature to pass a proposed drivers' license bill and to its passage of the Norton Highway Code and of the Sullivan gasoline tax bill. Many of the difficulties in Ohio, according to *The Ohio Motorist*, come from opposition of interests and bitterness of feeling between urban and rural sections.

The Automotive Journal, organ of the Pennsylvania Automotive Association, in its May issue comments chiefly on the dropping of compulsory liability insurance legislation for this year, but comments also on two bills which, it says, "if signed by the Governor will strike at the reckless driver." These bills provide that in cases where a person against whom a judgment is recorded for personal injuries, death or property damage allows said judgment to remain unpaid for a certain period of time, certification of such unsatisfied judgments shall be made to the Secretary of Highways, who shall forthwith revoke the license. Under these bills the *Automotive Journal* says "if a motor vehicle owner damages or destroys or injures and does not satisfy justifiable claims he is removed from the highways."

Truck interests weren't very well satisfied with the actions of the New Jersey legislature this year if the official bulletin of the Motor Truck Club of New Jersey expresses a majority opinion. "The past session of the Legislature," this organ says, "was one of the worst ever held. All motor vehicle legislation was held off until the last week and then shoved through."

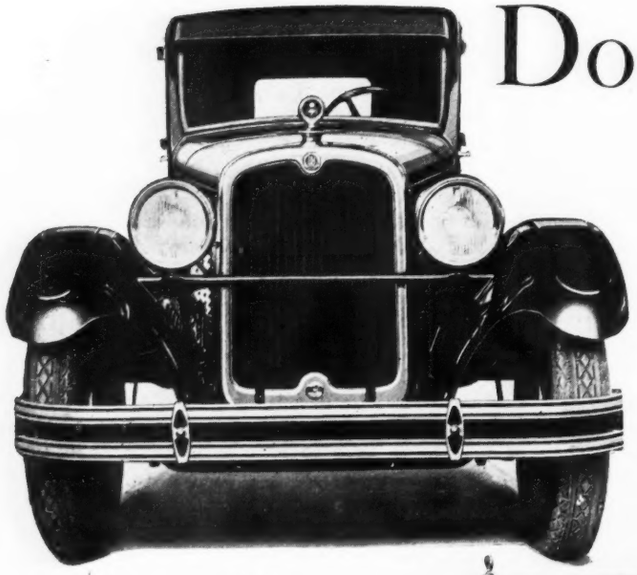
The Carolina Motorist has been devoting attention to gaining the support of Carolina Motor Club members and others for the Hoover Code, while *Apropos*, organ of the Automobile Club of Missouri, is actively behind the proposed regulation of motor vehicle common carriers as outlined and agreed upon by the Motor Vehicle Conference Committee. Down in Maryland, the legislative committee of the Baltimore Automobile Trade Association reports, following the closing of the Maryland legislature, that "no bill injurious to the automobile trade was passed by the legislature and all bills approved by the Baltimore Automobile Trade Association have been enacted into laws."

Despite the fact that the motor vehicle still seems to be subject to over-legislation, an examination of the scattered returns thus far available on 1927 state legislative activities seem to indicate a gradual growth of more intelligent handling of automotive legislation. The educational work of the National Automobile Chamber of Commerce, the American Automobile Association and its various affiliated state organizations, the National Automobile Dealers Association and various local dealer organizations, the Motor Vehicle Conference Committee and other cooperative motor vehicle organizations gradually is taking effect. Very definitely, it looks as though automotive legislation in the future might be of a sounder and more intelligent character than some of that which has been enacted in the past.

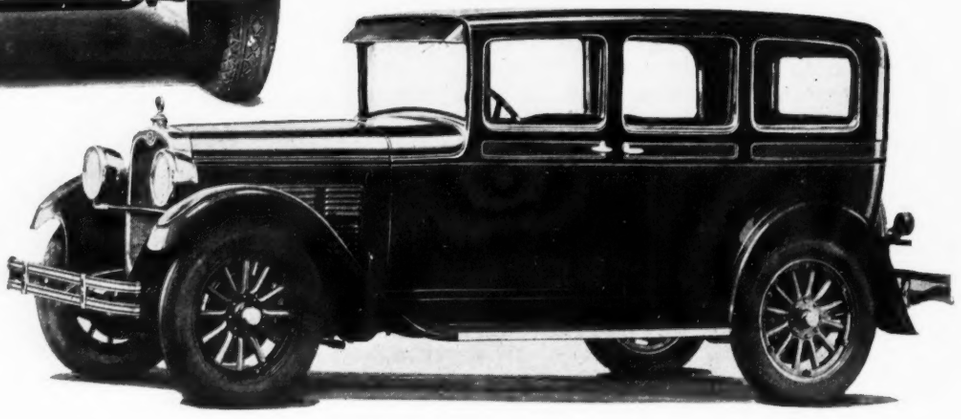
Dodge's New Six

224 cu. in. engine characterized by heavy crankshaft. Only one body style in production, a four-door sedan.

By A. F. Denham



Above—An unusually narrow nickel-plated radiator shell is used on the new Dodge Senior, which, combined with wide fenders, give the car a massive appearance from the front



Right—Double-belt molding and horizontal louvres combine to give this four-door sedan on the new Dodge six-cylinder line a low, long appearance

DODGE BROTHERS, INC., is now in production on its new Senior line, which takes it into the six-cylinder field after many years of concentration on four-cylinder models. At first only a single body style will be marketed—a four-door sedan which is to be sold for $1,595. Other types, including a four-passenger coupe and a cabriolet- roadster, will be added in the near future. The new model follows established practice throughout and introduces no radically new features.

An unusually heavy crankshaft features the engine, which, although built by Continental, has been designed and developed by Dodge Brothers, Inc. Other chassis units with the exception of hydraulic four-wheel brakes, are similar to the corresponding units in the present four-cylinder line, including a single plate clutch, standard shift three-speed transmission, semi-floating, spiral bevel rear axle, semi-elliptic springs, I-beam front axle, and worm and sector steering gear.

69-Lb. Crankshaft

Incorporated in the six-cylinder L-head engine, with a bore of 3¼ and a stroke of 4½ in. is a 69-lb. crankshaft having seven main bearings. The front bearing, which also takes the thrust, is 2⅜ in. in diameter, while the others are 2⅝ in. Crankpin diameters are 2⅜ in. A total of 11 in. of main bearing length is provided, divided up as follows: Front, 2-1/16; center, 1⅞; rear, 2-5/16; intermediates, 1-3/16. With a total piston displacement of 224 cu. in., this gives one sq. in. of crankshaft bearing projected area for 7.91 cu. in. displacement. N.A.C.C. rating for this engine is 25.3 hp.

Camshaft drive is by a Morse center-guide chain of ½ in. pitch and 1½ in. width, with a manual take-up by means of an eccentric bushing on the generator support. The shaft is supported in four bearings, decreasing in diameter from front to rear, diameter and lengths of the bearings being as follows:

	Diam.		Length
Front	2-3/8	x	1-23/32
2nd	2-5/16	x	1
3rd	2-9/32	x	1
Rear	1-7/8	x	2

Chromium-steel cam followers operate the 1-7/16 in. silchrome exhaust, and 1½ in. nickel steel intake valves. The combustion chamber has been designed to secure maximum turbulence, the highest point being immediately over the intake valve, at which point the spark plug is also located.

Pistons are of the Nelson steel-strut aluminum-alloy, four-ring type, all four rings being located above the piston pin. The three upper rings are ⅛ in. while the lower one, which is of the oil ontrol type, is 5/32 in. wide. Twe snap rings are used to locate the full-floating ⅞ in. piston pin in the piston, the pin itself being 2¾ in. long. Connecting rods are conventional in design and 9½ in. between centers, the lower end bearings being 2⅜ in. in diameter and 1-7/16 in. long, centrifugally cast on the rod.

Lubrication is by pressure to main, connecting rod and camshaft bearings. From the main header part of the oil is passed through a filter. Thence it is returned to the chain case, flowing back into the pan. The oil pump, which is inclosed in the sump, delivers the oil under pressure through drilled passages to the main bearings. Thence it is fed through drilled passages in the crankshaft to the connecting rods, and through drilled passages in the cylinder block casting

Announced—Sedan *is* $1,595

to the camshaft bearings. Oil pump drive is through a vertical shaft at the center of the engine, driven by helical gears from the camshaft, the distributor being located at the top end of the shaft. A feature of the pressed steel oil pan is the separate splash pan which is secured to the crankcase with the same bolts as the oil pan, a gasket being used on each side of the splash pan. Crankcase oil capacity is 7 qt.

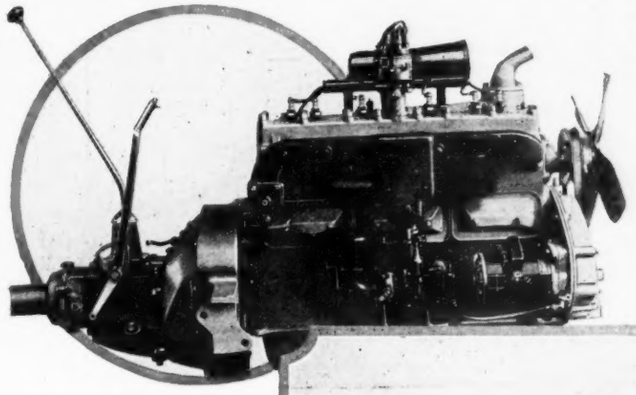
Located back of the fan and driven through the fan shaft is a centrifugal type water pump, which delivers cooling water through a manifold at the side of the engine to the rear cylinders. This manifold is combined with the removable water jacket cover plate, which also serves for the oil filter mounting. Water is also carried around between inlet and exhaust valve guides, cored passages extending to the valve seats. An outlet riser is provided at the top of the detachable cylinder head, and is provided at the front end with an integral bellows type thermostat. Small passageways are provided through the thermostat valve and between the pump and the cylinder block to prevent the forming of steam pockets through total lack of circulation.

Both water pump and fan thrust are taken through two Timken roller bearings incorporated in the fan mounting; the fan being driven by a ¾ in. V-belt. Take-up for this belt is obtained by screwing the front flange of the fan pulley towards the rear flange, a set screw being provided for locking the adjustment. An oil thrower is provided at the front end of the crankshaft, as well as a cork washer, to prevent oil leakage at this point.

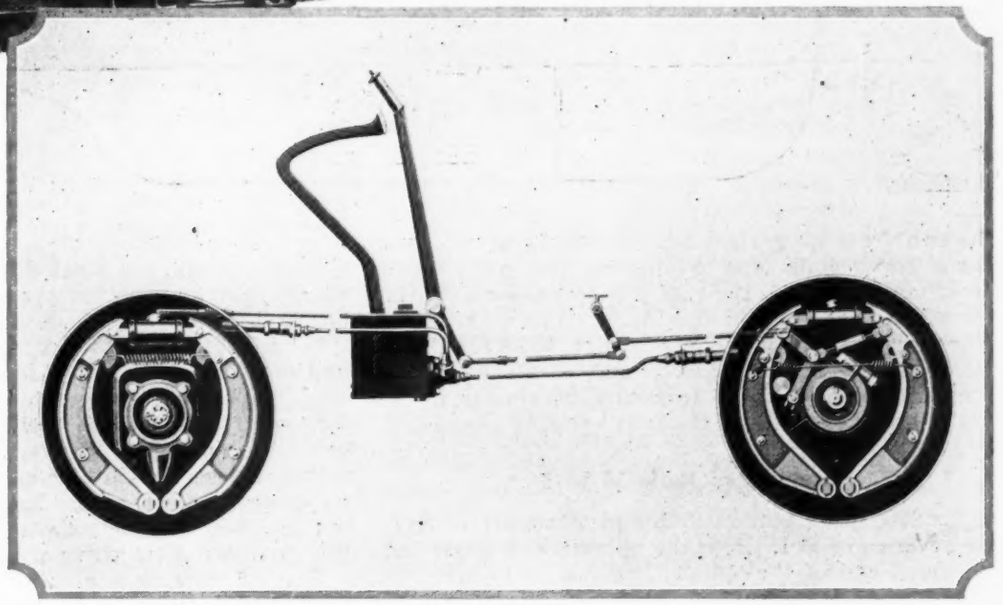
North-East 6-volt electrical equipment is used throughout. The distributor has been designed for semi-automatic spark advance, 20 deg. manual control being provided. With full manual advance the spark is set to occur 12 deg. before top dead center. The firing order is 1-5-3-6-2-4. A 5/16 in. plate is used to mount the North-East generator, which is driven from the accessories sprocket through a laminated spring coupling. This method of drive and mounting enables the generator to be removed without disturbing the timing chain. Bendix starter engagement is used.

Two strainers and a gasoline filter are provided in the fuel line. Vacuum feed is used and the tank at the rear of the chassis holds 16 gals. A Stromberg 1¼ in. carburetor is standard, and an air cleaner is also furnished. The intake manifold is partly jacketed by the exhaust manifold. A double butterfly valve at the rear end of the exhaust manifold, controlled from the dash, either allows the exhaust gas to pass directly into the muffler through the passage nearest the blocks, or forces it around the intake manifold, whence it escapes through the second passage. It might be supposed that this would tend to build up considerable back pressure in the exhaust manifold. It is claimed, however, that the auxiliary passage is used only when starting, and then for such a short period that the effect of the back pressure is negligible. The front portion of the inlet manifold is shielded against airflow from the fan, to prevent excessive cooling and consequent unequal distribution.

Engine suspension is of the four-point rigid type,

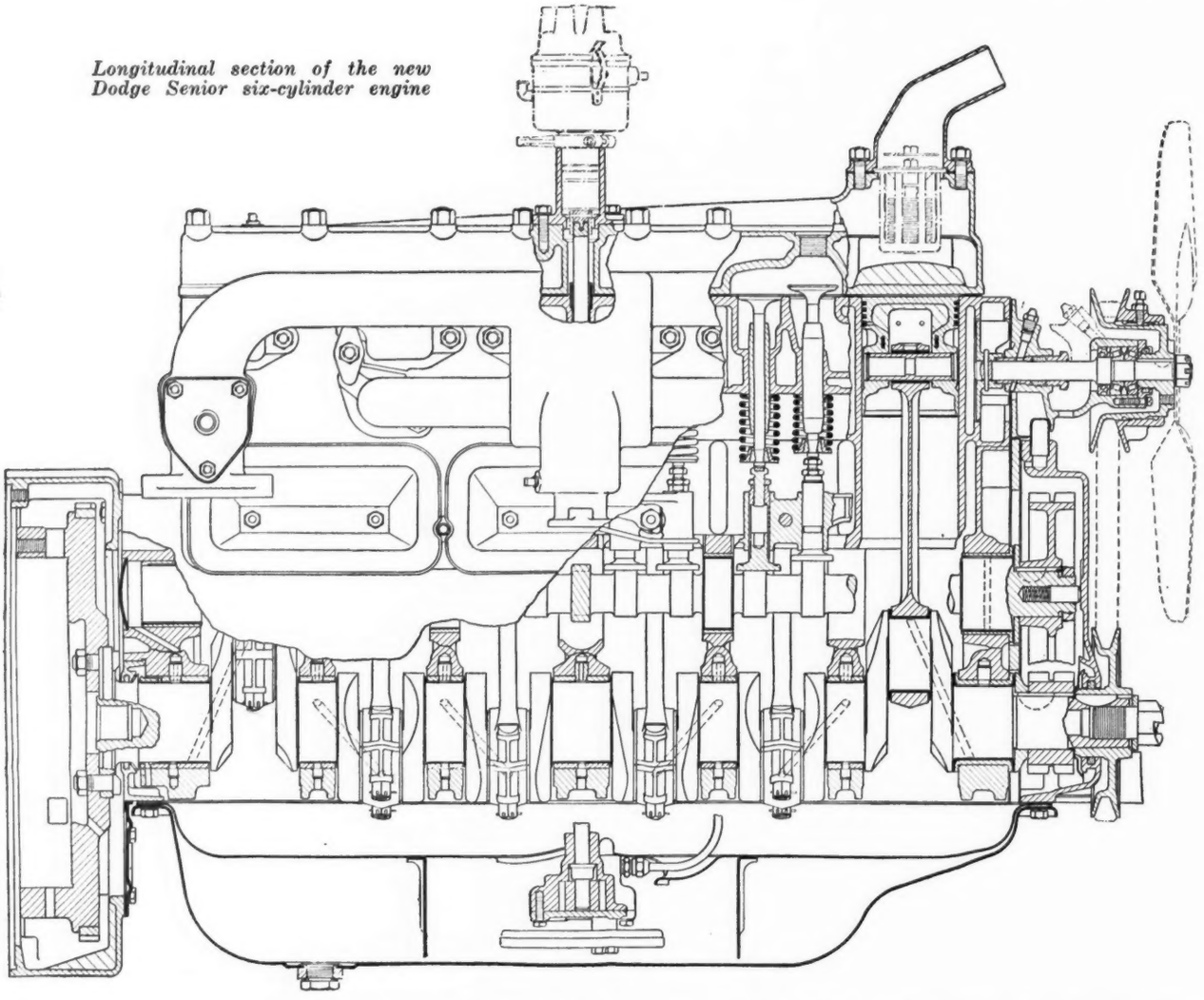


Above—A by-pass is provided in the exhaust manifold on the six-cylinder engine of the Dodge Senior, to enable intake heating when starting. The water pump is back of the fan in the cylinder block



Right—The Lockheed hydraulic brakes are of the latest type, with an oil reservoir surrounding the master cylinder. Note the rear wheel brake, which can be operated optionally, either by hydraulic or mechanical application

Longitudinal section of the new Dodge Senior six-cylinder engine



the two front supports being cast integral with the chain cover plate, and resting on the front frame cross member, while the rear engine supports are integral with the flywheel housing. In unit with the engine are the 11-in. single plate clutch, built for Dodge Brothers by Borg & Beck, and a standard-shift conventional three-speed transmission, similar to the one recently adopted on the four cylinder chassis.

Low Speed Ratio 14 to 1

The low speed gear ratio is approximately 14 to 1; the reverse, 18 to 1. Both the countershaft gears and the front end of the splined shaft are supported on Hyatt roller bearings. A feature of the clutch is the ball bearing used in the clutch release mechanism. This is lubricated by a grease cup with a flexible tube, the cup being accessible without removing the floor boards. The sheet steel clutch housing is centered by counterboring the flywheel housing. A deflector hole in the flywheel keeps grease and oil away from the clutch plates.

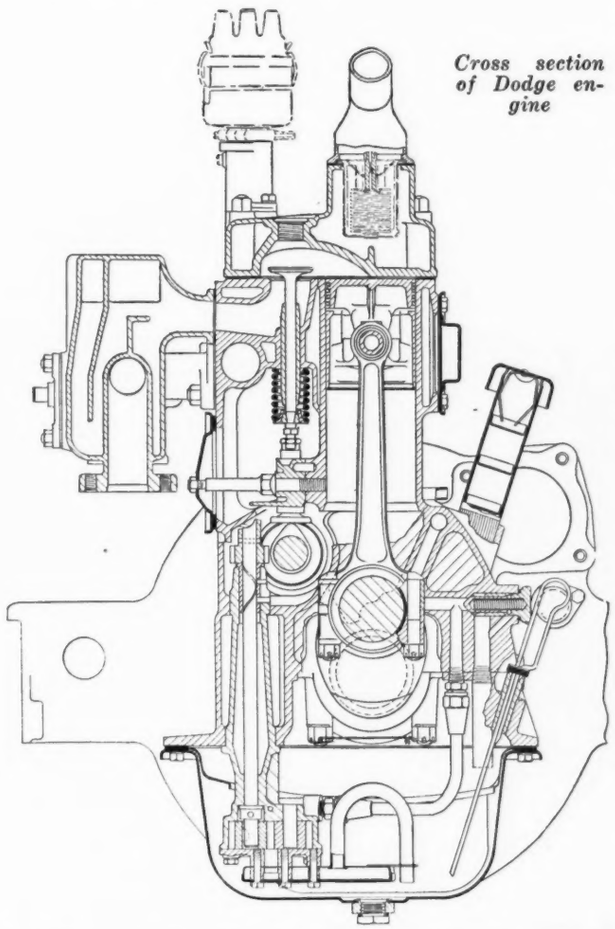
Following previous Dodge Brothers practice, a metal universal and a tubular propeller shaft are used. Gear reduction in the spiral bevel semi-floating rear axle is 4.54 to 1. The axle is the same design as in the four-cylinder model, with a pressed steel housing of 7/32 in. stock, chrome vanadium heat-treated steel gears and shafts, and adjustable taper roller bearings. The frame also follows closely the four-cylinder design, the chief difference being the provision of front and rear bumper brackets integral with the spring hangers.

Semi-elliptic springs of 2 in. width are used in front and rear, the rear springs being underslung, 55½ in. long, while the front springs are 37 in. Spring shackles are of conventional design and rubber stops are provided above the axle supports. Reverse Elliott ends are used in the I-beam, heat-treated chrome-vanadium-steel front axle. Ball thrust bearings transmit the load from the axle to the knuckles, which latter are of the same material as the axle.

Ease of steering is obtained by using a 13 to 1 reduction in the worm and sector Gemmer steering mechanism. Lockheed hydraulic internal four-wheel brakes are operated by the pedal, while the hand lever operates the rear wheel brakes through mechanical connections, the rear brake shoes being so designed as to permit the optional use of either hydraulic or mechanical operation. Brake-drums have an internal diameter of 14 in. and are fitted with linings of 1¾ in. wide and 3/16 in. thick.

While the four-door sedan is equipped with wood wheels as standard, it is possible that additional models in the line may be equipped with disk or wire wheels. Tires on all models are 32 x 6.00 in. balloons mounted on 20-in. rims.

Composite construction is used for the body of the



Cross section of Dodge engine

four-door sedan. Individuality is obtained through the use of a very narrow, nickel-plated radiator shell and horizontal louvres, while double belt moldings give the car a low appearance. Exterior finish is in lacquer, the basic color being blue with black belt moldings and yellow striping. Interior finish is unusually attractive. At present the cars are coming through in eithe dark gray mohair upholstery or light grey broadcloth.

Windows Trimmed in Walnut

The same materials are used for finishing interior panels, while windows are trimmed in burled walnut. Arm rests are provided for the rear seat, while silk toggle grips, draw shades, foot rest and robe rail are all standard. Grouped under a distinctive instrument panel are an eight-day clock, speedometer, oil pressure gage, ammeter, and electric control gasoline gage, an additional gage being provided on the fuel tank at the rear. The instrument panel is lighted by an external lamp which is provided with a shutter. The switch for the dome light has been placed on the right center door pillar where it is handy for the driver.

At the right of the instrument panel are two buttons for operating the choke and the manifold heat control. A locking ignition switch is provided at the left of the panel. Both throttle and spark control levers are mounted on the walnut steering wheel, while the lighting switch is located just below the wheel on the steering column. A nickeled lever is provided below the instrument board to operate the cowl ventilator. Additional ventilation is furnished by means of the crank operated swinging type windshield. Remote control is used for operating the doors, a simple twist of these handles to one side locking the doors from the inside.

Included in the standard equipment of the four-door sedan are front and rear bumpers, snubbers all around, vanity and smoking sets, a rear vision mirror, a vacuum-operated windshield wiper and an engine thermometer on the radiator cap. A North-East speedometer is furnished.

Universal Testing Machine

A UNIVERSAL testing machine designed for mechanical testing of various structural parts of automobiles and trucks in addition to standard tensile, Brinell and other tests of metals and alloys, has recently been developed by Alfred J. Amsler & Co., Switerland, and is being distributed in this country by Herman A. Holz, New York.

The testing machine proper works on the hydraulic principle. Tests are made between crossheads, one of which is locked at a suitable height to the two upright columns of the machine frame while the other is locked to two suspended columns carried by the ram of the hydraulic press. Each crosshead can be locked to either the fixed or movable columns so that in the space between the two crossheads either compression or tensile tests can be made.

For compression tests, two round compression plates are attached to the two crossheads. The distance between the plates is about 53 in. For compression testing wheels with rubber tires, two large square compression plates are furnished.

For transverse tests, such as made on leaf springs, a beam is fixed in a horizontal position on the lower crosshead. The end supports for the test piece rest on two small carriages which can run on wheels along the beam. For tensile tests the upper crosshead is locked to the movable columns and the test piece is gripped in serrated wedges which move in the two crossheads. The machine can grip flat bars and strips up to ½ in. thick and 2 in. wide and round pieces up to 1 in. diameter.

For all tests the measurement of deformation as evidenced by the travel of the movable crosshead can be read on a graduated scale and it can also be transmitted by means of a thread to the recording drum on the pendulum dynamometer, where it is registered, together with the load, on a diagram. The maximum load for all tests is 10 tons.

The stroke of the ram is about 8 in. The pendulum dynamometer is arranged for four degrees of sensitiveness—10 tons, 5 tons, 2 tons and 1 ton. Oil pressure is produced by a cam pump driven by a ½ hp. motor. The speed at which the movable crosshead travels upward can be regulated as desired from zero to a maximum of about 8 in. per min. Special equipment is available for adapting the machine for making tensile tests on pieces up to 9/16 in. diameter and for very short, sholdered test pieces; for making Brinell hardness tests; for making shearing tests on wires up to ⅜ in. diameter and bars up to 5/16 in. square, and for making bulging tests of thin metal sheets.

Net weight of the testing machine is about 1850 lb. and of the pendulum dynamometer with pump and motor about 550 lb. No special foundation is required for this equipment.

TWO Belgian automobile manufacturing firms, Minerva Motors and Societe Anversois pour la Fabrication de Voitures Automobiles (Sava), both located in Antwerp, have been amalgamated.

Parts Makers Ask *Car* Builders to Change *Buying* Methods

Hand-to-mouth purchasing policies claimed a drawback to profitable plant operation. Cooperative sales campaign also planned to further interests of the independents.

By John C. Gourlie

TELLING blows at some of the most urgent problems of the automotive parts industry were delivered at the sectional meetings of the Motor & Accessory Manufacturers Association, held May 18 in Detroit, May 19 in Cleveland, and May 23 in New York.

Out of the informal talks and discussions of the meetings grew, on the part of the manufacturers of original equipment, a determination to adopt the principles of cooperative salesmanship in bringing before motor car manufacturers the advantages to be gained by the purchase of parts from independent sources.

Not less important was the approval of a plan to seek the support of the National Automobile Chamber of Commerce in the eradication of evils arising from hand-to-mouth buying too earnestly pursued. Diversification of outlets was again urged as a necessary means of stabilization for equipment makers.

Told Results of Survey

Finally, the members interested in selling to the trade were presented the results of survey showing graphically the changes in automotive wholesaling and retailing that are going on so rapidly as to require constant changes in sales plans if producers are to keep in step with evolutionary tendencies.

Figures tending to show that original equipment makers are among the leaders of industry in efficiency of manufacturing were given by C. W. Miller, vice-president, Thompson Products, Inc., in urging the members to cooperate in carrying their message to the car manufacturers. Mr. Thompson is a member of a committee which is preparing the data for presentation.

The gains in efficiency were made in face of a declining dollar volume, according to Mr. Miller's figures. In 1924 the average motor vehicle had $247 of original equipment bought from outside sources; in 1925 the average had risen to $261 and in 1926 fallen to $185. This drop was probably due to lower prices rather than lower unit volume, if the figures, necessarily estimates, are nearly correct, and the seriousness of the competitive situation is thereby emphasized. The current year, due to greatly increased volume, ought to make a much better showing.

The average wholesale value of automotive vehicles in 1924 was $643, in 1925, $688, and in 1926, $714. Therefore the unit equipment maker's share in the three years was respectively 38.5 per cent, 37.5 per cent and 26 per cent.

Mr. Miller then offered the results of an analysis made by Ernst & Ernst, public accountants. In 1926 industrials companies totaling 479 and representing 25 industrial groups had 10.4 per cent net increase in profits over 1925 while 20 car manufacturers had a 22.5 per cent increase and 24 parts makers a 14 per cent decrease.

The ratio of sales to inventories and the change in inventory values between 1920 and 1926 was given as follows:

	Sales Ratio		Inventories	
	1920	1926	1920	1926
Automobile Mfrs.	2.99	6.05	1.00	77
Parts Mfrs.	4.40	5.23	1.00	52
All	3.93	5.14	1.00	76

Thus, to make clear the reading of the figures, in 1926 automobile manufacturers' sales volume was about 6 times inventory, and parts manufacturers' sales volume about 5¼ times inventory. Rather more striking, however, is the other record, showing that parts manufacturers' inventories in 1926 were only 52 per cent of 1920, against 76 per cent for all groups.

Still better, as showing the soundness of the parts industry, were the following analyses, the first columns showing ratio of current assets to current liabilities and the others the ratio of inventory to working capital:

	Ratio of Current Assets to Current Liabilities		Ratio of Inventory to Working Capital	
	1920	1926	1920	1926
Automobile Mfrs.....	2.23	3.26	1.28	.65
Parts Mfrs.	2.27	6.26	1.33	.51
All	2.85	4.64	1.07	.63

In working capital position, therefore, and in working capital turnover the parts makers have hung a splendid record.

Strengthened by Struggle

Evidence accumulates that these major betterments in corporate management grew out of a tense struggle for existence on the part of the equipment makers. Pressure upon them in the realm of prices and deliveries has been very heavy, and their response has been of enormous benefit to the industry as a whole. Without the flexibility in deliveries and the almost constantly lowered prices, motor car prices could not have been brought down to present levels and volume of business would have been correspondingly restricted.

Under present conditions, motor car manufacturers are frequently able to stop parts shipments in 24 hours, even where definite contract specifications for delivery have been made. These sudden stoppages are costly to the parts makers and they are so prevalent at certain periods of the year that profitable operation is virtually impossible.

Against such practices the equipment makers have naturally chafed. Some have even tried to continue shipments contracted for, risking loss of an account, but the car manufacturer has the answer to this move. He finds defects in parts previously satisfactory and ships them back to the supplier.

No Organized Protest

However unfair these abrupt cancellations of shipment orders may have appeared to the parts manufacturers, they have voiced no organized protest. But when the tendency appears, as it has, to amplify the system of hand-to-mouth buying to the extent of not contracting for shipments for the minimum period ahead necessary to the parts maker in the planning of his schedules and his purchases of materials, there is a disposition to seek corrective measures.

Declaring that the pendulum has swung too far to hand-to-mouth buying, H. L. Horning, president of the association and of the Waukesha Motor Co., pointed out to the members that there is no substitute for good judgment in business, and judgment involves the planning of production for a reasonable period ahead.

"There is a point reached when a manufacturer either has to increase his inventories or add to his tool and machinery equipment in order to be prepared to meet deliveries," said Mr. Horning. "Some have adopted the latter course, making unnecessary additions to plant without apparently realizing that they are costlier than adding to inventory.

"Lack of confidence in the future has been carried to extremes."

Mr. Horning discussed the matter of contract forms, saying that a uniform and fair and equitable contract if it could be developed by the parts makers and approved by the purchasers of equipment would be a great help. There would naturally have to be some elasticity, as some items can be made and shipped on shorter notice than others. But even so there would probably be situations not covered by contracts.

Further discussion led to a decision to authorize the directors to name a committee to consider contracts and to take up with the N. A. C. C. the whole subject of buying specifications. It was felt that the car manufacturers would see the justice of the association's position.

Talk on Distribution

Talking on automotive distribution, David Beecroft, vice-president, Chilton Class Journal Co., described the wholesale field as in a state of rapid flux, with most jobbers adding lines, some dropping them, but all in a restless seeking for products that will continue to be salable and to yield a steady profit.

The growth of the small town market, of specialty and replacement parts wholesalers, of chain stores and of car distributors' lines have all contributed to the changes, which have been accentuated by the retailers' disposition to buy only in immediately salable quantities.

With the piling up of products for distribution, Mr. Beecroft pointed out, the general line jobber added lines—too many for economical handling. He found after a time that most of his business—as much as 85 per cent—was in 18 to 20 items out of the several hundred carried, and he started to cut down. When the motor car distributor came into accessories, the jobber turned to replacement parts, tires, radio, batteries, oil and other lines, seeking those that would bring repeat orders and in which the jobber's service would hold the business.

Another important factor in the wholesaling of accessories, Mr. Beecroft pointed out, was the increasing tendency of the nationally known and advertised lines to be merchandised by chain stores.

He then took up the changes among automotive electrical wholesalers forced by development in the repair and service station field, which now handles most electrical service work. Allied lines were first taken on and then others not connected with electrical equipment.

Mr. Beecroft found in a survey of 155 electric wholesalers that 125 were carrying radio batteries; 110 motor car batteries; 112 ball bearings; 86 shock absorbers; 85 headlights; 75 carburetors; 82 radio; 71 electric shop equipment, while nearly all had starting, lighting and ignition service parts. Smaller numbers of the group were carrying such lines as tires, roller bearings, chassis replacement parts, brake lining and even electric refrigeration and domestic oil burners. In all 77 per cent had added new lines in the past year.

Similar developments were revealed by Mr. Beecroft's survey of wheel and rim wholesalers, 60 per cent of whom have added chassis replacement parts and 65 per cent automobile accessories. The parts and accessories were mainly allied to wheels and rims but there was the same tendency to go into such lines as carburetors, oil filters, air cleaners and oils. Other specialty houses, Mr. Beecroft found, were adding lines.

The conclusions drawn were that manufacturers should look to the small towns for expansion of distribution; could not expect effective results from a single type of jobber; and should realize that the average jobber is seeking lines that carry repeat and installation business. Lines without this feature may have to go through other channels.

Caldwell Speed Reducer

H. W. CALDWELL & SON Co., Chicago, has recently developed a new speed reducer which is furnished in two models. Type A for general industrial service and Type B specially designed for screw conveyor service.

The speed reducer is a complete self-contained unit inclosed in a rigid housing which provides proper support and alignment for all parts. Two separate drives are used, a Link Belt silent chain drive from the high speed shaft and a cut spur gear drive to the low speed shaft. The silent chain drive runs in an oil retaining casting while the spur gears run at low speeds in an oil bath. Timken roller bearings are employed to reduce friction.

Lubrication of gears and bearings is automatic from a large oil reservoir in the base of the housing. All parth are acessible by removing the upper half of the Type A housing while the Type B housing is split vertically. Speed ratios may be changed at any time by substituting different sized motor pinions or silent chain wheel. No flexible coupling to the motor shaft is required as the silent chain provides the necessary flexibility. The speed reducer is made in sizes to furnish ratios from 7:1 to 40:1 in the Type A and to 30:1 in Type B.

Just Among Ourselves

Wages Declining as Profits Go Down

A GOOD many months have passed since wages were one of the topics uppermost in discussions of automotive production costs. Most automotive executives became convinced a good while ago that wage levels in themselves couldn't be considered too seriously in talking about costs; that the cost per unit of production after all was the important thing. More and more manufacturing supervisors got clearly in mind the fact that a wage reduction of 10 per cent often would permit an influence on selling cost of less than one per cent. Wage levels in important automotive districts such as Detroit have declined somewhat in recent months. No great general reductions have been announced, but a detailed downward revision of total earnings per man has come about in many plants for many lines of work. In some cases this readjustment probably was felt to be necessary because of constantly falling profit per unit; in others, advantage probably was taken of a labor supply and demand situation temporarily favorable to the employer. There seems to be no general desire on the part of the industry to cut wages, however, many executives feeling rather strongly the desirability of keeping them up to the highest level which manufacturing necessities will permit.

* * *

Racing May Show Whether Speed Claims Are Justified

THE air seems to have been full of discussions about stock car racing the last few days. Our location near the site of the first event of this kind in recent years may put us into the midst of more talk than we would hear if we were in Detroit, but men from all parts of the industry seem to be taking a good deal of interest in the subject so far as we can make out. Generally speaking, more engineers than sales managers seem to look favorably on stock car racing. That's natural, we believe, since there is little to be gained from these races from a selling standpoint, although certain engineering advantages may be derived.

* * *

Most Manufacturers Better Out Than In

THE A. A. A. doubtless has something of this kind in mind in its advocacy of stock car racing at this time. To the extent that stock car racing may help to eliminate exaggerated advertising claims, we are in accord with its aims, but we still feel, as stated previously, that the average, well established automobile manufacturer may have more to lose than to gain from stock car racing. Too many elements which have little or nothing to do with normal vehicle utility enter into the winning or losing of a race. Consequently it is hard to see how stock car racing can be very attractive to a large proportion of manufacturers.

* * *

Boys and Girls as Car Owners

ALONG with the woman buyer, the young boys and girls have come to have some importance as automobile prospects in recent years. There are plenty of arguments against permitting minors to own vehicles, but the fact remains that a great many of them do. Just how many, is problematical, but Robbins B. Stoeckel, commissioner, Department of Motor Vehicles, Connecticut, is authority for the statement that a proposed law regarding ownership of vehicles by minors would apply to about 15,000 registrations in his state. That means that about 7.16 per cent of the cars registered in Connecticut have been registered by persons of less than 21 years of age. If that same proportion should hold throughout the country, it would mean that nearly 1,400,000 vehicles now on the road are the property of minors.

* * *

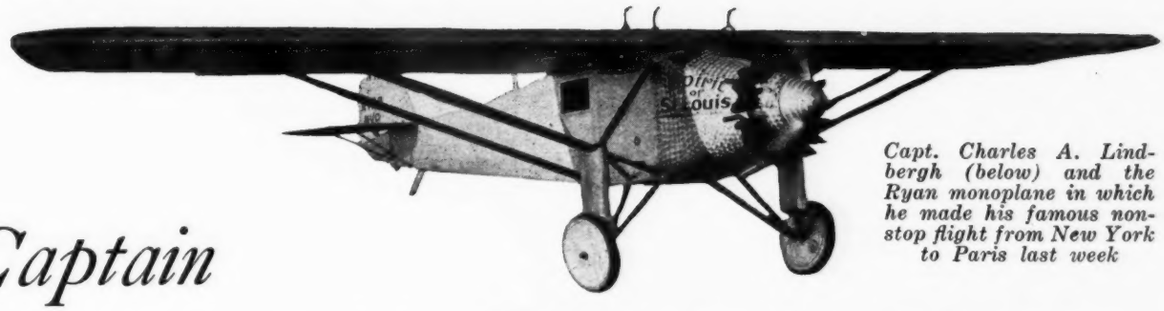
A Market Worth Thinking About

THIS number is sufficiently large to make a market worth giving a bit of thought to. A large proportion of the cars owned by minors, it will be objected, consist of semi-wrecks which shouldn't be allowed on the roads anyhow. We strongly agree with that viewpoint, but have a feeling that the only way this condition finally can be remedied is to find some means of selling this group on the "class" and value of getting decent automobiles for their personal purposes. Despite restrictions, many boys of 17 to 21 today are going to have automobiles. Hudson's advertising of the Essex speedabout as exemplifying "the spirit of youth at a price that youth can pay" seems to us an interesting experiment in the right direction.

* * *

Our Next Issue of Special Interest

AND now to complete the job of covering the sessions of the summer meeting of the Society of Automotive Engineers. Then back to Philadelphia to add the story of the meeting to our annual Engineering Issue, out on June 4. That issue, by the way, has some features this year which appeal to us as unusually good; we hope you'll like it.—N. G. S.



Capt. Charles A. Lindbergh (below) and the Ryan monoplane in which he made his famous non-stop flight from New York to Paris last week

Captain Lindbergh's N. Y.-Paris *Machine a* Special *Ryan* Monoplane

General design same as that of M-1, but wing span is 10 ft. greater. Engine is Wright J-5-C, developing 223 b.hp. at 1800 r.p.m. Empty weight 2150 lb.

THE airplane which Capt. Charles Lindbergh used last week in his famous New York-Paris flight is a product of Ryan Airlines, Inc., and follows in general design the Ryan M-1 monoplane which has been used successfully in commercial service and air mail work on the Pacific coast. The Ryan M-1 was fully described in *Automotive Industries* for July 29, 1926.

The NYP model which Capt. Lindbergh flew has a span of 46 ft. (10 ft. greater than the M-1) and a chord of 7 ft., giving a total wing area of 319 sq. ft. The Clark Y air foil section is used as on the standard model. The engine is a Wright J-5-C which produces 223 b.hp. at 1800 r.p.m. A duralumin propeller set at 16¼ deg. pitch and made by Standard Steel Propeller Co. is employed. The engine is air-cooled.

Useful Load 2985 Lb.

The empty weight of the plane equipped with all instruments is 2150 lb. as compared with about 1100 for the M-1 model. The useful load totals 2985 lb. and is made up approximately of 2600 lb. fuel; 175 lb. oil; 170 lb. for pilot and 40 lb. miscellaneous.

Thus the gross load at the start of the flight when fully loaded with gasoline was about 5130 lb. while at the finish with all fuel used but with 10 gal. of oil left the total weight would be 2415 lb. The wing loading at the start of the flight was 16.1 lb. per sq. ft.; and the power loading 23.0 lb. per b.hp. At the end of the flight with all fuel exhausted these factors would be 7.57 lb. per sq. ft and 10.8 lb per b.hp.

Calculated performances for the plane under full load are: Maximum speed 120 m.p.h., minimum 71 m.p.h., economic speed 97 m.p.h. at 1670 r.p.m. Similar performances with fuel load exhausted are: 124.5 m.p.h., 49 m.p.h., and 67 m.p.h. at 1080 r.p.m.

6.95 Miles Per Gallon

Under full load and at the economic speed with full rich mixture 6.95 miles per gal. are obtainable while 13.9 m.p.g. are possible with light load and lean mixture. At the ideal speeds of 97 m.p.h. at the start of the flight diminishing to 67 m.p.h. at the finish the maximum range of the ship is 4110 miles while under practical flying conditions of 95 m.p.h. starting and 75 m.p.h. finishing speeds the range becomes 4040 miles.

In performance tests made on the NYP plane 129 m.p.h. was made over a measured 3-kilometer course with the plane carrying 25 gal. of gas and 5 gal. of oil. This is approximately equivalent to 124 miles per hour with full load of 425 gal. of gas and 25 gal. of oil. Distance of take off ranged from 229 ft. with plane loaded to 2600 lb. gross weight against a 7 m.p.h. head wind to 1023 ft. with load of 4200 lb. against no head wind.

Lindbergh is credited by the Geological Survey with having covered 3610 miles on his non-stop flight across the Atlantic. On this basis he broke the non-stop distance record made last October by the French aviators, Rignot and Costes, who flew 3313 miles from Paris to Persia. His time for the flight was 33½ hours and his average speed therefore was about 108 m.p.h.

High- Speed Portable Tools *Make* Possible Production *Economies*

One installation of this kind consists of grinders powered with squirrel-cage induction motors operating on 180-cycle current.

IT is an ever recurring surprise to see the number of portable tools that are being used in automotive plants. We hear so much talk of automatic machinery, everything done by mechanical means, etc., that it is a bit surprising to find hundreds of small tools, each one operated by a workman, carrying on very important manufacturing processes.

In a large body plant the other day I came across an installation of portable tools which is relatively new and which, according to the production men in the plant, offers some rich opportunities for lower production costs in many automotive plants. The installation consisted of a large number of portable grinders powered with squirrel-cage induction motors operating on 180-cycle current. These particular tools are the product of the Chicago Pneumatic Tool Co., and have been given the trade name of Hicycle.

As explained by the plant electrical engineer, the advantages of these high frequency tools are that their normal free speed is 10,800 r. p. m. as compared with 3600 r. p. m. for 60-cycle tools, and also that, whereas the slip under load may be as great as 50 per cent for 60-cycle or d-c. motors, it is not more than 10 per cent with high frequency equipment.

This high speed may be utilized in three ways. If the work permits, the full loaded speed—which will be in the neighborhood of 9900 r. p. m.—may be used. If, as with grinding equipment, the maximum permissible speed is limited by the wheel structure, the high frequency equipment may be geared down to the allowable speed to give greatly increased power. And finally, if all of this increased power is unnecessary for the job, the whole equipment may be much lighter.

In this body plant the last two advantages have been made use of by using three-to-one ratio gears to reduce loaded speed to about 3400 r. p. m. and the tool has been lightened so that without grinding wheels they weigh 13½ lb. as compared with about 26 lb. for the air tools formerly employed.

In the work performed another saving has been made because of the possibility of one high frequency tool replacing two of the old tools. Under load, the speed of the former tools was so low that coarse wheels scratched the surface of the metal being ground while fine wheels did not cut fast enough for quantity production. So a compromise was made by taking a roughing cut with a fairly coarse stone and finishing with a fine stone. Loaded speeds are so great with the high frequency tools that a fairly coarse wheel can be used for the whole operation and while it cuts faster than either of the tools used before it leaves a finished surface free from scratches.

I was able to get a copy of some comparative cost data between the new tools and those formerly used. These give a better picture of what high frequency equipment means to production costs than any word description could.

One interesting point about these figures is the lower piece rate now paid for high frequency operations. One reason

Comparative Cost Data for High Frequency Grinders and Grinders Formerly Used by Large Body Plant

Current consumption of electrical tools—high frequency—1.3 cents per hr. or 13 cents per 10 hr. day.

Operation: Removing spot welds without filing on production schedule of 2000 pieces per 10 hr. day.

Cost with former equipment:

Power cost—16 tools @ 70c per day	$ 11.20
Piece work @ 5c each for 2000 pcs.	100.00
Total cost	$111.20

Cost with high frequency equipment:

Power cost—9 tools @ 13c per day	$ 1.17
Piece work @ 2.75c each for 2000 pcs.	55.00
Total cost	$56.17

Cost of month's (25 days) operation with former equipment	$2780.00
Cost of month's (25 days) operation with high frequency electrical tools	1404.25
Monthly saving of high frequency tools over former equipment	$1375.75

for this—and the principal one, of course—is the greater production which is possible, but another factor has to do with the effect of the use of the tools upon the workman.

The old grinder weighed about 26 lb. and if the wheel were loaded with its full weight it would run very slowly and, in fact, would probably stall. This, then, made it necessary for the workmen to hold the wheels a little off the work in order to obtain maximum results and a 10 hr. job of lifting a 26 lb. weight was not an easy job.

With the high frequency tools, which weigh about half as much, the job of holding them up would be very much lightened, but this is not necessary. Their full weight on the work does not reduce the speed below about 3400 r.p.m. and the workmen are accustomed to lean on them a little to still further increase the pressure between the wheel and the work.

To supply alternating current at 180 cycles it is necessary to install a frequency changer if lower cycle, a-c. current is available, or a motor-generator set if d-c. current is wired to the plant. This condition seems to presuppose that for high frequency tools to be employed economically the cost of the current supply installation must be spread over a fairly large number of individual tools. In this connection, it was pointed out by the electrical engineer of the plant where I saw this installation, that even should high frequency tools fully bear out the promise made by their present results this will by no means indicate that other forms of portable tools will cease to have extensive fields of usefulness.

There are now, and will continue to be, it seems, a large number of operations carried on in isolated locations or under particular conditions which will require air-operated tools, or low cycle or d-c. electrical tools, for most economical service.

Anyway, high frequency tools appear to hold considerable promise and already a number of manufacturers have developed equipment of this type for drills, grinders, taps, wrenches, etc., or are now working on it, while there have been several large installations of high frequency equipment in automotive plants.

Highway Research Board Studies Tire Wear

MANY of the investigations which have been conducted by various members and associates of the Highway Research Board have a very direct automotive interest and there follow abstracts of a few of such studies as have been completed recently covering the subjects of tire wear, air resistance of moving vehicles, and motor truck impact forces.

The Highway Research Board is an organization sponsored by the Division of Engineering and Industrial Research of the National Research Council and includes among its members some 25 national organizations, among which are listed the Society of Automotive Engineers, National Automobile Chamber of Commerce, Rubber Association of America and the American Automobile Association, as well as contact men in every state and in many colleges and universities.

As a result of an investigation of tire wear made by the State College of Washington, O. L. Weller reported that the following conclusions had been drawn:

1. Tire wear increases with speed. Sufficient data are not available to indicate the rate of increase.

2. Road tests indicate an increased wear with higher temperatures. High temperatures are very destructive of tires.

3. The wear of rear tires is greater than that of front tires, the relative wear of rear tires being as great as 200 per cent on smooth pavements and as little as 118 per cent on gravel surfaces with a probable average value of 150 per cent of front tire wear.

4. Tire wear per ton of car is probably consistent for any given road surface when all influencing factors are measured by the same standards.

A progress report of similar tests made with balloon tires by the University of Kansas and reported by W. C. McNown leads to the following general conclusions:

1. Balloon tire wear is less affected by difference in road surfaces than are high pressure tires.

2. Firm-surfaced roads such as asphalt, brick and concrete all have nearly the same effect upon the thread wear of balloon tires.

3. Development types of road surfaces such as sand-clay, gravel and probably earth, all dry and in good surface condition, cause less tread wear on balloon tires than do the firm surfaced types mentioned in (2).

4. Front tire wear is greater than rear tire wear on firm surfaced roads and is less than rear tread wear on loose surfaced roads.

Investigations have been made of the air resistance of automobiles with the idea of determining whether measurements obtained by causing air to pass by a stationary vehicle are applicable without change to a vehicle moving through the air. This work was carried out by Noah Wolford, Oklahoma A. & M. College. The general plan of the investigations was to place vehicles on a dynamometer mounting on an ordinary railway flat car and to measure the wind force against the mounted vehicle as the whole was pushed along a stretch of level track at various speeds.

As a result of these tests it was demonstrated experimentally and practically that the exponent of V in the air resistance formula should be 2 instead of 2.14 and 2.10 as have been obtained by previous experimenters.

In an investigation of the impact forces exerted by motor trucks on the highway which has been conducted by the Bureau of Public Roads and reported by James A. Buchanan, the following conclusions have been drawn:

1. As static load increases, road impact reaction increases.

2. As static load increases the ratio of road impact reaction to static load decreases.

3. Thickness and narrowness of tread rubber are desirable in reducing road impact reaction.

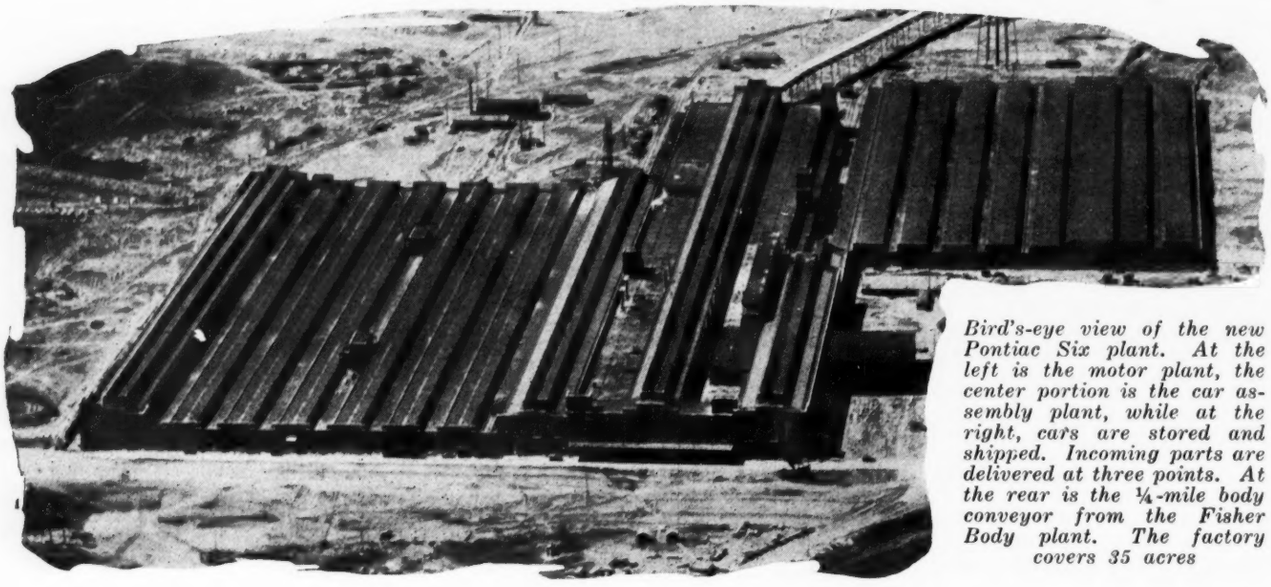
4. Increasing the thickness or profile height of rubber has a very marked effect in reducing road impact reaction in both single and dual mountings.

5. In the tire equipments tested, dual mounting caused heavier impact forces than the corresponding single mounting of the same load carrying capacity.

6. Appreciable variation of cross sectional rubber or breaks in its continuity cause heavy repeated impacts to be delivered to the road.

7. Dual mounted tires should always be mounted with the tread design staggered.

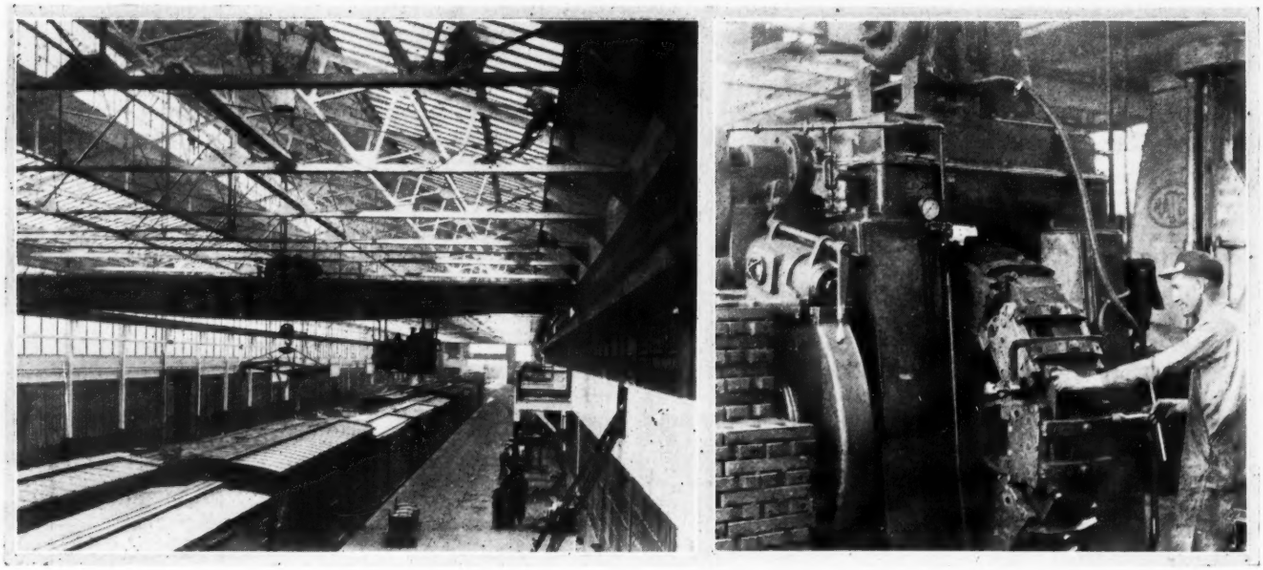
Some Details of Pontiac's New



Bird's-eye view of the new Pontiac Six plant. At the left is the motor plant, the center portion is the car assembly plant, while at the right, cars are stored and shipped. Incoming parts are delivered at three points. At the rear is the ¼-mile body conveyor from the Fisher Body plant. The factory covers 35 acres

WITH the completion of the new Pontiac Six plant, the Oakland Motor Car Co. has greatly increased its production facilities. The plant is considered one of the finest in the industry. While two car assembly lines are now used, the installation of a third is contemplated and $2,700,000 has also been appropriated for the construction of a foundry adjacent to the new plant. A revamping of the Oakland plant at Pontiac is also in process. Employees in these two plants now total 86,000, of which 72,000 are shop workmen and 14,000 office people.

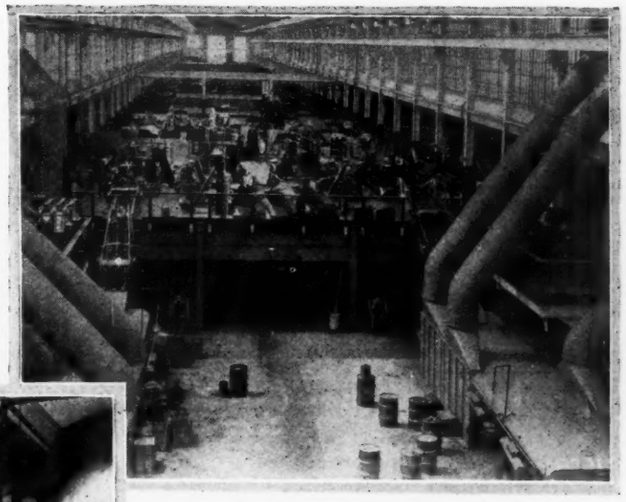
The basic idea behind the layout of the new Pontiac plant is the uninterrupted feeding of parts towards one point. For instance, unfinished motor parts are delivered at the extreme left to the heads of the various machining lines. These work to the right, where the motor assembly line runs at right angles. Motors are then carried by conveyors to the proper point in the final assembly lines as are all other parts, the assembly line paralleling the motor assembly line in the center building. Finished cars are driven through a tunnel to the car storage and shipment plant at the extreme right. By this arrangement all operations from receiving of materials until delivery of cars to consignees are carried on under cover. The plant was erected at a cost of $15,000,000.



Left—One of the two sets of tracks at each side of the car assembly plant receiving incoming finished parts. These are placed on movable platforms and are trucked directly to the assembly line, there being no store-rooms. Right—One of the large multiple milling machines used for finishing cylinder heads in the motor plant. Natural light is used throughout the Pontiac factory

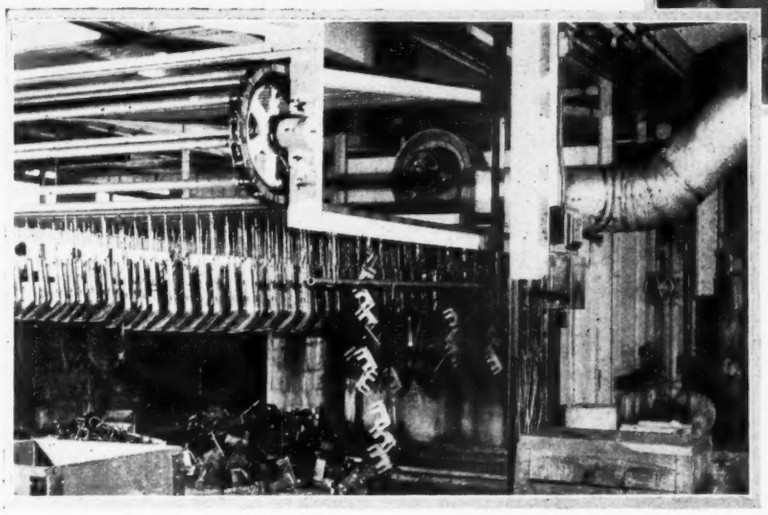
$15,000,000 *Plant*

Company's production facilities greatly increased by completion of one of finest factories in industry.

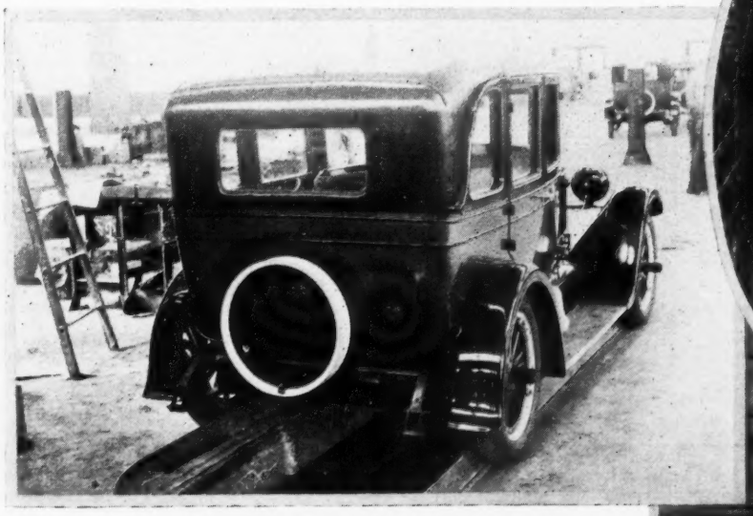


Above—Looking down the assembly line. In the center the assembly conveyors go over a hump to the second floor. This provides a clear passageway underneath for handling materials and makes it unnecessary to bring enameled parts and the smaller parts down to the main assembly floor. Car assembly lines move at about 9 ft. per minute

Below—A number of gravity feed conveyors such as this one, used for charged batteries, are used to deliver parts to the car assembly lines

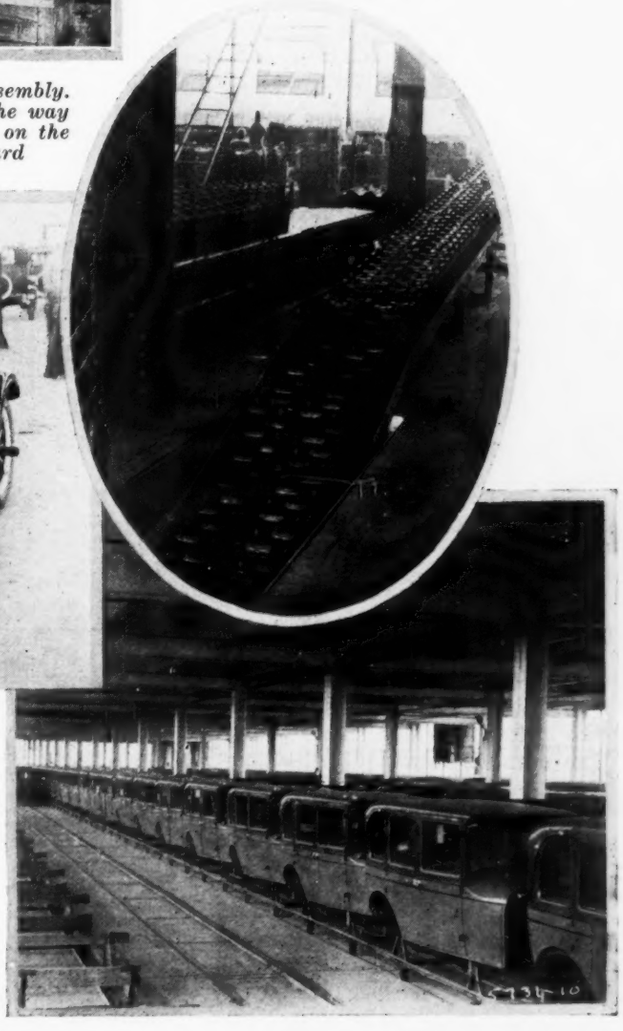


Above—Small chassis parts are enameled before assembly. This shows such parts on overhead conveyors used on the way to the dipping vats and ovens. The enameling room is on the roof of the car assembly division to reduce fire hazard



Above—A unique feature of the shipping department is the use of pits to facilitate tying the frames down to the axles before shipment

Right—Bodies received through the conveyor from the Fisher Body plant are assorted on the second floor and placed on the movable platforms riding on the tracks shown. Bodies are fed forward with pneumatic pushers



New Brennabor *is* Lowest Priced Six-Cylinder German Car

Built under American production methods and priced to sell from $1,650 to $1,750. Engine has displacement of 156 cu. in. Wheelbase 129½ in., track 56 in.

By Edwin Heinze

GERMANY'S second largest motor car works, the Brennabor, have brought out a new model which is being sold at a price considerably below the prices asked by any of the other 12 works in Germany building six-cylinder passenger cars.

Brennabor, in existence since 1871, is a privately-owned enterprise under the management of four brothers, one of them a very progressive engineer who has studied American production methods. These have been adapted by him to German conditions with complete success. The new model ranges in price between $1,650 and $1,750, according to body, whereas the models of the nearest competitor, Adler (the third largest factory in Germany) range from $2,500 to $5,000.

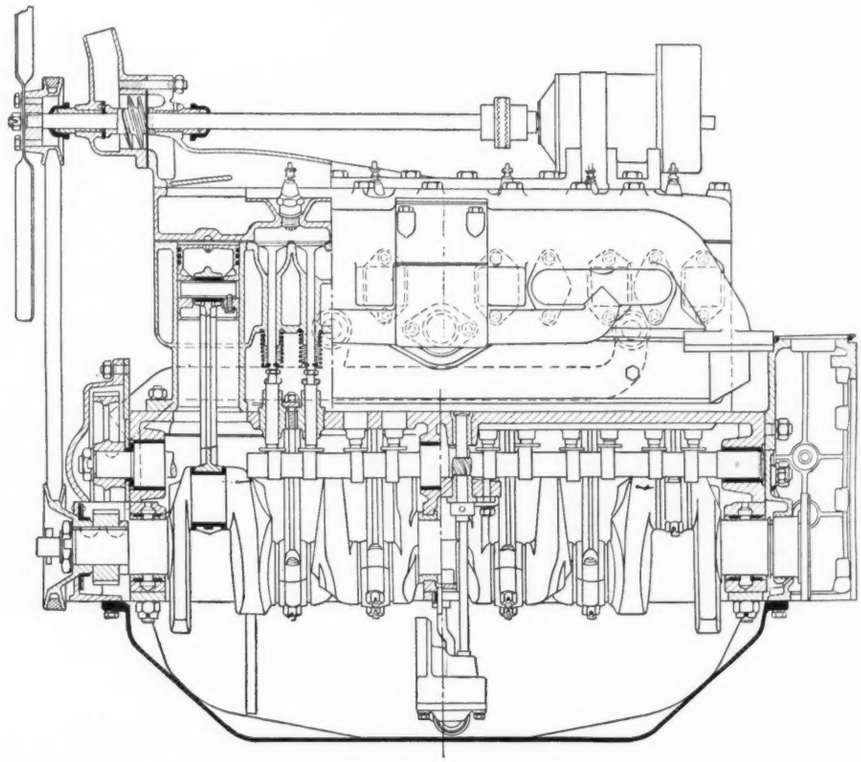
The new Brennabor chassis has a wheelbase of 129½ in. and a track of 56 in. Frame length for the body is 111 in., the over-all length 177 in. and the over-all width, 68 in. The weight of the closed car is 3500 lb. Although the engine has a displacement of only 156 cu. in., the bodies, in keeping with German requirements, are seven-seaters, the gearing being accordingly high in ratio. The maximum speed is somewhere between 55 and 60 m.p.h.

The cylinders, which have a bore of 70 mm. (2¾ in.) and a stroke of 111 mm. (4⅜ in.) are cast in one block. The large diameter valves are on the left side. The aluminum crankcase is in two parts, divided horizontally. The crankshaft and camshaft are mounted in the upper half, the lower one serving simply as sump.

The crankshaft is carefully balanced and runs in three babbitted bearings. At the front end it carries a pinion which meshes with a fiber gear on the camshaft. The stump for the cranking handle, projecting outside the crankcase, carries a pulley for the radiator belt.

A Pallas carburetor is used which draws air from the crankcase, into which it passes through a rotary type of air filter, also of Pallas make. Fuel is fed by vacuum and ignition is supplied by a Bosch magneto, the magneto being still preferred in Germany to battery ignition. The magneto is mounted at the front end, being driven off the fibre gear on the camshaft. The ignition control lever forms a neat fitting in the center of the steering wheel.

Lubrication is by means of a gear pump in the sump, driven by helical gears and a vertical shaft from the center of the camshaft. Before entering the pump the oil has to pass through a strainer secured to the drain hole cover plate. The oil is forced from the



Longitudinal section of Brennabor six-cylinder engine

pump through the hollow crankshaft to the main and subsidiary bearings, which latter (camshaft and oil pump) are ball bearings.

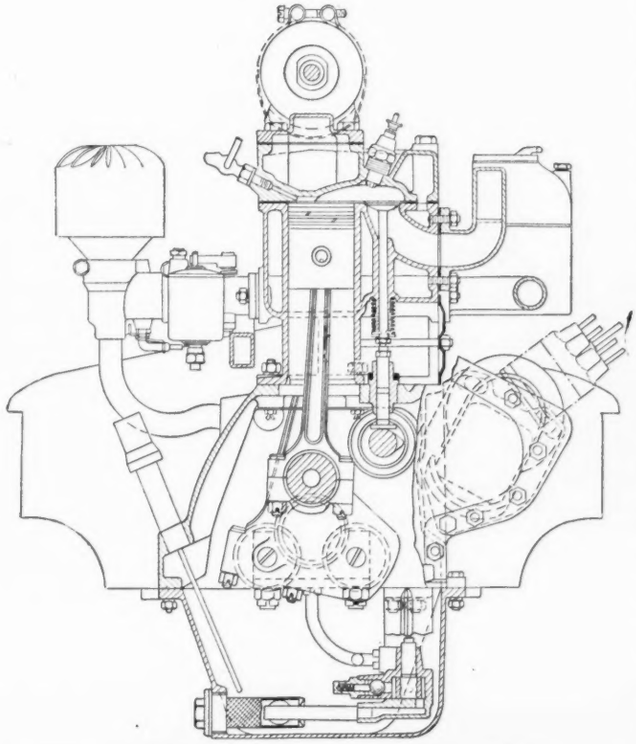
The cylinder head is also a single casting, and its forward end acts as a support for the shaft of the combined four-blade fan and water circulator type of pump. The fan shaft is driven by belt from the crankshaft and projects from the rear side of the pump to form a connection with the generator that is mounted on top of the rearmost cylinders.

The clutch is of the single-dry-plate type, a flexible joint being interposed between it and the four-speed gear box, the latter being flanged to the engine, with which it thus forms a single unit that is suspended at three points. The steering mechanism is of the worm and segment type and is situated at the left side, a rather large wheel being furnished. Gear-shift and brake levers are in the center of the car. The propeller shaft has two metal universal joints. Torque and propulsion are taken up by semi-elliptic springs. The final drive gears have spiral-bevel teeth.

Artillery Type Wheels

The road wheels are of the artillery type with wooden spokes, and, as is the practice in Germany, a complete spare wheel is furnished, it being carried at the rear. Straight side balloon tires are fitted 30 x 5.77 in. The frame is of pressed steel channels of rather deep profile, 160 by 50 by 4 mm. (6.3 by 2 by 0.157 in.). The foot brake acts on the four wheels and is mechanical. It is a special Brennabor design of the internal type and fully compensated. The hand brake acts on the propeller shaft immediately behind the gear box. Both brakes are easily accessible.

The general appointments of the new car are unusually rich for German conditions and considering the low price. Everything a private owner can reasonably ask, from a cigar lighter to an automatic windshield wiper, is included in the regular price.



Cross section of Brennabor engine

The consumption, a factor to which much importance is attached in Germany, is 4½ to 5 gal. of gasoline per 100 miles. Brennabor is now preparing a 1½ ton delivery truck carrying the same engine. This will be the first German six-cylinder utility vehicle of that size.

Pamphlet on Oil Engines

A PAMPHLET entitled *Schnellaufende Oelmotoren fur Kraftfahrzeuge* (High Speed Oil Engines for Motor Vehicles) by Ludwig Hausfelder, has been issued as an extension of a paper presented to the Automobile and Aero-technical Society at Berlin. The pamphlet is published by M. Krayn, Berlin W-10, Genthiner Strasse 39, Germany.

The various problems connected with the design of light, high speed engines working on the Diesel principle are discussed with thoroughness, and actual engines of this type are illustrated and described. As to the present status of the Diesel type motor vehicle engine, Mr. Hausfelder has the following to say:

"If we disregard tractors, motor plows and locomotives, for which the Diesel engine has been used successfully for some time, we may look forward toward a wider application to motor trucks in the near future. However, its field of application is not to remain limited to heavy commercial vehicles, but, on the contrary, it is to be assumed that it will enter into competition with the carburetor type engine for light vehicles also. Thus, for instance, the Dorner Oel-Motoren A. G., Hannover, built a light passenger car for about 550 lb. useful load, which is equipped with a solid injection Diesel engine. The engine works on the four-stroke principle and comprises two air-cooled cylinders arranged V-fashion, of 2¾ in. bore by 4 in. stroke, which develops approximately 4.5 hp. at 1400 r.p.m."

According to test results published in the special press, when using gas oil of 0.864 specific gravity, the engine developed 4.5 hp. at 1400 r.p.m., consuming fuel at the rate of 0.605 lb. p. hp.-hr., developing a brake mean effective pressure of 55 lb. p. sq. in. and showing a brake thermal efficiency of 23 per cent. This was the normal load test. Under overload the engine developed 6 hp. at 1400 r.p.m and consumed 0.66 lb. p. hp.-hr., the brake mean effective pressure being 73.5 lbs. p. sq. in. The combustion during the test was faultless. An illustration of the Dorner chassis is given in the pamphlet.

FOR the past five or six years Leeds & Northrup, Philadelphia, Pa., has been working on the development of an electrical CO_2 meter as a means of measuring the efficiency of boiler room operation and has now placed on the market such a meter which is guaranteed to give readings to an accuracy of within one-half of one per cent CO_2.

The meter is based on a principle developed in the Bureau of Standards and consists of passing flue gas around a heated platinum wire which is mounted in a metal chamber and comparing the electrical resistance of this wire with that of an identical platinum wire mounted in an identical metal chamber which is surrounded with a gas of known composition.

In Bulletin No. 781, just published by the company, not only is a complete description of the new meter given but there is also considerable information with diagrams and charts pertaining to furnace operation.

Crankcase Oil Reclaiming System Developed by Sharples

Drainings are charged into treating tank, clarifying solution added and mixture agitated by pump. Separated in centrifuge after passing through heater coils. Three systems of heating.

An equipment for reclaiming used crankcase oil has been developed by the Sharples Specialty Co., Twenty-third and Westmoreland Streets, Philadelphia, Pa. A regular process has been worked out to which the drainings from crankcases are subjected, and it is claimed for this process that it will remove water, diluents, carbon and other sediment, and restore the oil to practically its original viscosity.

Fleet owners—for whom the apparatus is more particularly intended—can reduce their purchases of new oil in most cases by 50 per cent by the reclaiming apparatus. Reduction in the expenditure for oil, however, is not the only benefit derived, as with the reclaiming apparatus in use the crankcases can be drained more frequently and the oil in them maintained at a better average condition, resulting in better lubrication and reduction of power losses and wear in the engine.

The entire equipment required for the Sharples process of oil reclamation is shown in Fig. 1. Crankcase drainings are charged into the treating tank, and a clarifying solution is added. The mixture in the tank is agitated by means of a pump which draws from the bottom and delivers into the top of the tank, and at the same time it is passed through heater coils. It is then run into the super-centrifuge, which is adjusted for separation.

In installing the equipment it is only necessary to make a connection by flexible hose or piping from the pump suction to the barrel or storage tank used for the dirty oil, and a connection by piping for the reclaimed oil to the barrels or storage tank; to install piping to carry the still vapors into the atmosphere or to a condenser, and to make the power connections to the centrifuge, heaters and pump.

Clean oil is discharged from one spout of the machine and is run into the still tank. The clarifying solution, carrying a large proportion of the carbon and other impurities, is discharged through the other spout. Solid impurities collecting in the cylinder are removed at intervals.

In the still the fuel elements and water are removed from the oil by steam heat, and the vapors from the still are usually exhausted into the outside air. The final step in the process is to run the hot oil again

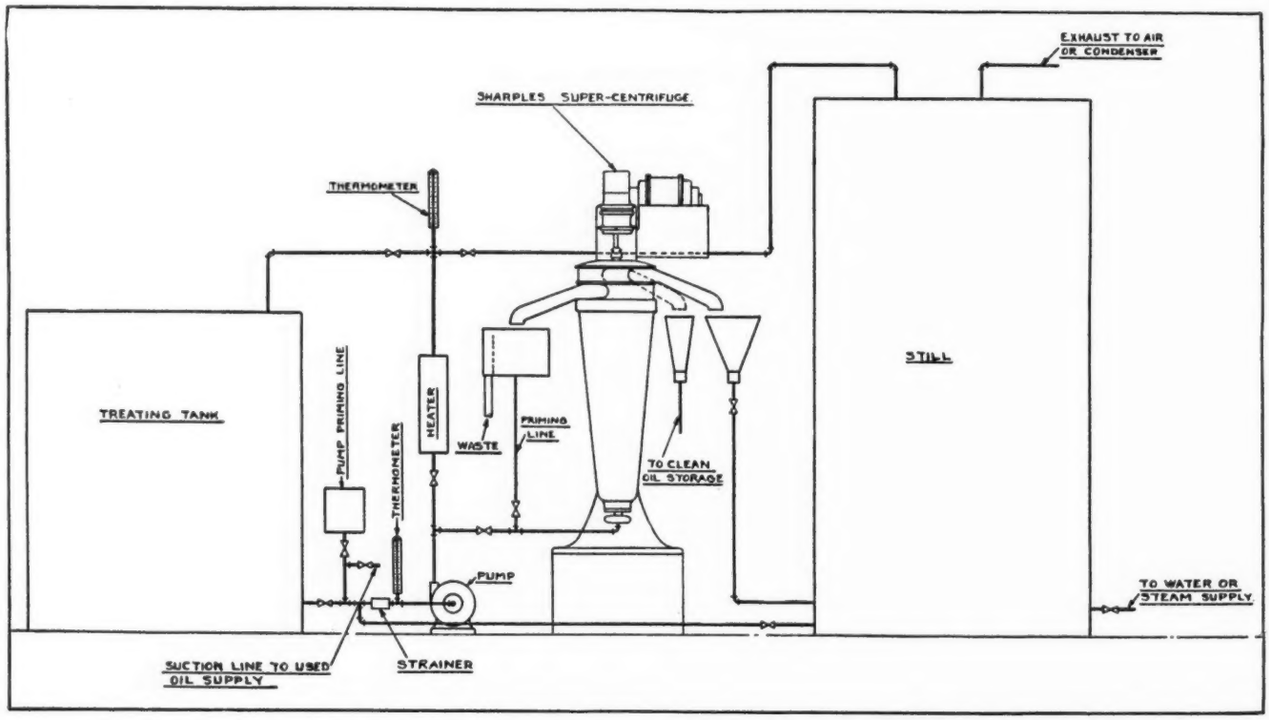


Fig. 1. Typical set-up of the Sharples crankcase oil reclaiming system, showing the various parts of the equipment and their relation to each other

through the super-centrifuge, this time adjusted for clarification. When it leaves the centrifuge this second time the oil is claimed to be clean and clear, and free from water.

As regards power required, the centrifuge may be driven by steam if of over 35 lb. p. sq. in. pressure, by belt from a line shaft, or from a motor. The pump may be driven either by belt or by motor.

A good deal more energy than required in the operation of the mechanical units is needed for heating the oil and driving off the diluents, and in the development of the process particular attention was paid to the problem of so arranging it that owners could utilize the system of heating which is most available in particular cases and most economical. They have the choice of the electric process, when no steam is available; steam-electric process when only low-pressure steam is available, or the steam process, when steam at 125 lb. p. sq. in. or over is available.

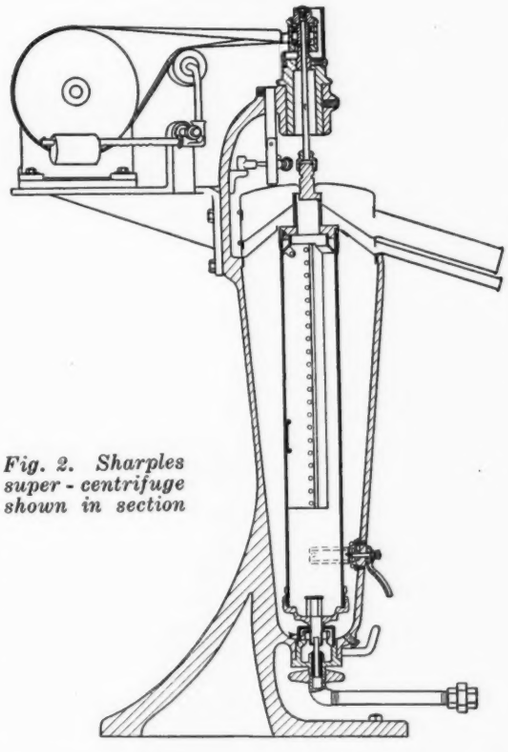


Fig. 2. Sharples super-centrifuge shown in section

In the first case electric heaters are used to bring the oil up to the proper temperature, and water is introduced into the apparatus, forming steam which helps to remove the diluents. In the second case heating is by electricity, steam being introduced directly to remove diluents. In the third process, steam is used for heating as well as for the removal of the diluents. The same results are obtained with all three processes, and the user may choose whichever best fits his conditions.

To meet the requirements of operators of small as well as of large fleets, the equipment is offered in three sizes, capable of treating 50, 100 and 200 gal. of crankcase drainings per batch, respectively. The 50-gal. unit includes a No. 5-A super-centrifuge, while the 100 to 200 gal. units include the No. 6. Other equipment is identical for the various units, except as to dimensions.

Time Required Varies

The time required to complete the processing of a batch of oil varies with the contamination of the oil, with the size of the apparatus and with the method used for heating the oil and removing the diluents. It is made up of the time taken for clarification and that taken for distillation. For an oil containing 21 per cent diluents and high in carbon and sediment, such as is obtained from crankcase after 1500 miles driving in winter time, the clarification time is 3¾ hr. for each of the two smaller units with each method of heating, and 7 hr. with the larger unit. The distillation time is 3 hr. for the two smaller units and the two processes involving the use of steam, 5¼ hr. for the two smaller units with electric heating, 4½ hr. for the larger unit with the use of steam and 8 hr. for the larger unit with electric heating. Thus the total time of the process varies between 6¾ and 15 hr. These times are said to be practically extremes and to be considerably reduced if there is less carbon and less diluent in the oil.

The demands of the user have an important bearing on the period of operation. Many will feel that it is not advisable or necessary to remove the last traces of dilution from used oil. The removal of the bulk of the diluents is relatively easy and is accomplished rapidly. To remove the last traces requires extending the time of operation and consuming power that does not seem warranted by the difference in results.

When the operation is stopped before dilution is removed completely, certain heavy fractions of the diluents are left in the oil. From an oil containing 20 per cent originally, as much as 2 to 3 per cent may remain without affecting flash, fire or viscosity appreciably. The user who is willing to employ a reclaimed oil that is somewhat lower in flash, fire and viscosity than the original new oil will save considerable operating time and expense, and will sacrifice but a small fraction of the mileage value of the oil. In but a few miles of operation of the average automobile the properties of an oil are brought below the values that are reached quickly and economically in reclaiming oil.

The following figures are furnished by the manufacturers with respect to the energy consumptions with the different processes per 100 gal. of drainings, and are said to be averages from many runs with drainings containing from 6 to 20 per cent of diluents: With the all-steam process, 12 kw.-hr. and 800 lb. of steam; with the steam-electric process, 12 kw.-hr. for driving the pump and centrifuge, 90-100 kw.-hr. for heating and 300 lb. of steam; with the all-electric process, 14 kw.-hr. for driving pump and centrifuge and 160-200 kw.-hr. for heating.

Following are analyses obtained by the manufacturers from reclaimed oil, as compared with analyses of new oils of the same brand:

	New Oil No. 1	Reclaimed Oil No. 1 Run A	Reclaimed Oil No. 1 Run B
Sp. Gr.	25.5 deg. Be.	24.5 deg. Be.	24.2 deg. Be.
Flash	400 deg. F.	365 deg. F.	395 deg. F.
Fire	460 deg. F.	445 deg. F.	465 deg. F.
Vis. @ 100	290 sec.	328 sec.	341 sec.
@ 210	50 sec.	49 sec.	50 sec.
	New Oil No. 2	Reclaimed Oil No. 2	
Sp. Gr.	20.6 deg. Be.	20.5 deg. Be.	
Flash	355 deg. F.	380 deg F.	
Fire	390 deg. F.	435 deg. F.	
Vis. @ 100	520 sec.	482 sec.	
@ 210	57 sec.	57 sec.	

The amount of finished oil recovered from a batch of crankcase drainings charged into the apparatus will vary considerably with the condition of the used oil. Experience has shown that water will be present normally to the extent of less than 1 per cent. Carbon and other sediment total 1 to 2 per cent. Diluting low boiling fractions may measure anywhere from 5 to 20 per cent without being considered abnormal. Condition of the engine, frequency of draining oil, quality of the oil, time of the year, and many other factors influence the percentage of dilution. Observations of many samples indicate the yearly average is about 10 per cent.

Luxury *vs.* Utility is Important Problem in Bus Design

Prospective buyers of bus bodies want visible quality and invisible merit, says International Motor Co. engineer in A.S.M.E. paper. Utility should be designer's chief aim.

SEVERAL subjects of automotive interest were discussed at the Spring Meeting of the American Society of Mechanical Engineers held at White Sulphur Springs, May 23 to 26, among them being a paper by Carlton Kemper of Langley Field on the design of combustion chambers for high-speed Diesel engines and one by L. C. Josephs, Jr., International Motor Co., on the design and construction of motor bus bodies.

According to Mr. Josephs, there are two things which all prospective buyers of bus bodies are looking for—visible quality and invisible merit.

Under visible quality are included utility, appearance and comfort. The body must be properly designed for the particular service it is to be used in. Seating arrangements are, of course, dependent upon the size of the bus and are also affected by legal restrictions imposed by various State bodies. The type of service influences many points of design, such as the head room, arrangement of entrances, spacing of seats and their design, and other similar factors which must all be considered if the resulting body is to present an appearance of greatest utility to the prospective buyer.

Appearance, said Mr. Josephs, is of next importance after utility and includes everything there is about a bus to look at, such as the color of the paint, the lines of the body, the interior decorations, etc. One of the greatest attractions buses have over other forms of public transportation is their appearance, which has enabled them to take riders from the other systems even at a higher fare.

Appearance is one of the hardest things to judge wisely because there is so much of the personal element in it. What may look well to one person may appear the opposite to another. The aim must be to choose all the details of the bus which affect its appearance so that the whole will closely approach what experience has proven to be the ideal desired by the type of patrons who are expected to use the bus. In general, Mr. Josephs believes, the tendency should always be toward simplicity.

Next in importance to appearance comes comfort and this item is also affected by the service to which the bus will be put. Among the details which must be watched are good window spacing with narrow posts which do not obstruct the view; adequate lighting arrangement for night driving; as nearly noiseless operation as can be obtained; good ventilation and heating; proper suspension and seat design to prevent vibrations reaching the passengers and similar items.

Invisible merit is intended to include the factors of safety, or strength; lightness; security against deterioration, and such items which have to be taken more or less on faith by the purchaser based on past experience with or the reputation of the maker. Mr. Josephs emphasized the fact that no ready means of making stress analyses in bus bodies has as yet been devised so that there appears to be no sure way of determining the factors of strength as compared with lightness except by actual operating experience.

One of the most serious problems in bus manufacture is the almost entire lack of any standardization in designs and a rather large style element in the field of bus bodies. Because of this fact and the other opposed requirement, that most purchasers desire quick deliveries, all designs must be based, as far as possible, on standard sub-assemblies or on some other method whereby frequent changes can be made in design details without seriously affecting production schedules and manufacturing costs.

Ease of manufacture is another important point in bus body design and proper consideration of this point by the designer can save much for the production budget. The design of corners was cited by Mr. Josephs as an example where complete information of production requirements is necessary before the designer can go ahead with his work properly.

Rigid Bodies, Most Popular

Rigid bodies seem to be most popular in this country and this brings up a serious problem in attaching them to the chassis, which must be somewhat flexible to compensate for road inequalities. Mr. Josephs outlines several means which have been utilized to accomplish this. In designing a rigid body he said the important point to keep in mind is to work from a closed box having equal strength throughout. To provide doors and windows it becomes necessary to cut holes in this box so that the frame work surrounding the openings must be reinforced in order to bring the structure back to its original strength. Following this method, he said, there is no difficulty in designing a rigid body.

Of the various materials available for body work, wood seems to be best for framework, according to Mr. Josephs, while walnut or mahogany, solid or in veneer, is popular as interior trim. The most important metal used in bus bodies is aluminum which is used in the form of sheets, tubes and castings.

Aluminum is very frequently used for body panels, although Plymetl and steel are both popular with some builders. Aluminum weighs less than steel, it is a little easier to handle and, when properly applied, will hold paint better than steel. On the other hand, it costs more.

A very large amount of leather and fabric is being used in bus construction. Some of the very finest and highest priced genuine leathers are being used in buses of the de luxe type. Mr. Josephs suggests that this may be but a passing phase as it seems unlikely that the public will continue to demand in public conveyances a seat covering or interior finish of a finer grade than can be found in the most expensive homes and clubs.

The present tendency appears to be toward lower priced leather for seats, imitation leather for interior trim and simple shades of durable material for windows. This question of luxury versus utility is a very important one, it was emphasized, since much of the present popularity of bus transportation has been due to the furnishing of a better type of service than has been possible in other mediums. Just how much of this luxuriousness can be dispensed with without causing a reaction on the part of bus patrons which may cause them to return to other means of transportation is a question to be carefully considered in connection with first cost and maintenance cost of high grade fittings.

As the result of a series of tests with experimental combustion chambers designed for high speed Diesel engines conducted at the Research Laboratory of the National Advisory Committee for Aeronautics and reported by Carlton Kemper, it was concluded that the performance of combustion chambers designed to give partial combustion and controlled turbulence indicates that it is possible to increase the r.p.m. of the fuel-injection engine without encountering excessive explosion pressures.

The tests emphasized the fact that an increase of capacity of the high speed fuel-injection engine depends upon the ability to obtain higher mean effective pressures and an improvement of the mechanical efficiency of the engine. Increasing the m.e.p. depends primarily upon complete mixing of well atomized fuel with the air charge and the reduction of the time lag of ignition. The required amount of turbulence to give complete mixing of the fuel and air may be obtained by the design of the combustion chamber. It is believed, however, that the necessary reduction in the time lag of ignition can only be obtained by better preparation of the fuel charge before injection into the engine.

Solution Suggested

The problem of increasing the mechanical efficiency of the engine and reducing its weight may be solved by an application of the engine design and construction principles of the aeronautic engine.

In the tests, a standard Liberty aircraft engine cylinder was used and was fitted with various types of combustion chambers. With a special aluminum piston giving a compression ratio of 11.4 to 1 there was a 50 deg. ignition lag when operating under power which resulted in explosion pressures of 1300 to 1600 lb. gage. Under this condition power output was considerably less than with the Liberty engine and the fuel consumption was more.

When fitted with a combustion chamber designed for fuel injection work it was found possible to vary the injection timing and to maintain maximum explosion pressures of 800 lb. gage. By directing the flow of the inlet air through the inlet valve it was possible to increase the i.m.e.p. from 82 to 96 lb. gage with a corresponding decrease in fuel consumption from 0.60 to 0.51 lb. per i.h.p. hr.

The use of a combustion chamber having a bulb type of precombustion chamber gave a compression ratio of 9.9. The b.m.e.p. at full load was 71 lb. while the i.m.e.p. for the same conditions was 106 lb. This large difference was due to the mechanical inefficiency of the single cylinder test engine. Assuming a mechanical efficiency of 80 per cent the b.m.e.p. would be increased to 84.8 lb.

A third type of combustion chamber was designed to give a high degree of turbulence within the pear-shaped bulb on the compression stroke and within the cylinder on the expansion stroke. This head was tested with a compression ratio of 13.5 to 1 and the compression pressures obtained in the engine were 450 lb. gage. The operation was smooth and regular under all loads. For full load operation at 1800 r.p.m. the b.m.e.p. with a mechanical efficiency of 80 per cent was approximately 85 lb. The corresponding fuel consumption was 0.60 lb. per b.hp. hr.

New Clinton Truck Models

TWO new truck models, 85-6 and 55-6, both six-cylinder, fast, bus-van chassis especially designed for moving-van and long-distance hauling, have recently been added to the line manufactured by Clinton Motors Corp., Reading, Pa.

Model 85-6 is powered with a 4 by 5⅛ in., six-cylinder engine, cast en bloc with removable heads and valves on side. It is three-point suspended, has force feed to all crankshaft, connecting rod and camshaft bearings and develops 78 hp. at 2250 r.p.m.

Transmission is selective with four forward speeds and reverse and is mounted amidship. Gear ratios are 5.35, 2.84, 1.76 to 1 and direct. Reverse ratio is 6.3 to 1. A multiple disk dry plate clutch is fitted.

The tubular propeller shaft carries four universal joints. Rear axle is worm type, full-floating, with drive taken through radius rods. The front axle is of I-beam type with roller bearings in wheel hubs and steering knuckle heads.

Service brakes are internal, operating on the rear wheels with 3½ by 17 in. shoes. Emergency brake is fitted to the rear propeller shaft and is mounted on the worm wheel housing. The frame is pressed steel, 8 by 3¼ by ¼ in., fitted with heavy gusset plates and cross members.

Lubrication is pressure gun type. Ignition is by high tension magneto. Springs are of chrome vanadium steel, semi-elliptic, bronze-bushed, 52 by 3 in. in the rear and 44 by 3 in. in the front. Cam and lever steering gear with 20 in. wheel is fitted. Wheels are Van metal, 20 in. diameter, fitted with 34 by 7 in. pneumatics front and same size dual rear.

Wheel base is optional to accommodate a maximum body length of 16 ft. Maximum speed is 40 m.p.h. Equipment includes electric horn, electric lights, ammeter, oil pressure gage and front bumper.

Model 55-6 is similar in design but slightly smaller. The engine is a six-cylinder, 3¾ by 5 in., and develops 60 hp. at 2250 r.p.m. The propeller shaft is fitted with three universal joints. Rear axle is spiral bevel type, semi-floating and fitted with roller bearings. Roller bearings are used in the front axle also.

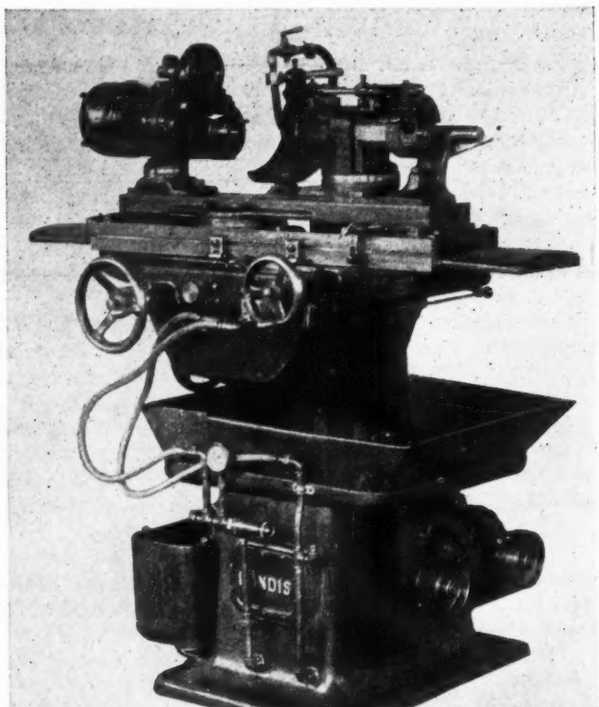
The service brakes are fitted with 2 by 15⅝ in. shoes. Front springs are 40½ by 2½ in., rear, 52 by 3 in. Tires are 32 by 6 in. pneumatic front and dual rear. Standard wheelbase is 168 in. to accommodate an 11 ft. body but wheelbase to accommodate a 13½ ft. body can be supplied.

The frame height is 27 in. in normally loaded position. Chassis weight is 5200 lb.

New Developments—Automotive

Landis Tool Grinder Redesigned

THE Landis tool and cutter grinder (Nos. 11 and 12), built by the Landis Tool Co., Waynesboro, Pa., has been redesigned recently and arranged for a completely self-contained drive. Two motors provide the power for driving the various units. The wheel spindle and traversing mechanism are driven by a 2 hp. constant speed motor mounted on the rear of the base of the machine. Power from this motor is transmitted through a double V composition rubber belt to a shaft in the base of the machine, and then by a 1¼ in. belt, which passes through the hollow column, to the spindle. This



Landis motor-driven tool and cutter grinder, right-hand front view

construction affords complete protection to the belt, while a gravity idler pulley maintains a uniform tension.

The headstock is driven by a 1/6 hp. constant speed motor, through two belts and reduction pulleys, giving a speed of 200 r.p.m. to the work. This motor is so mounted that the full universal features of the headstock are retained. It can be swiveled 180 deg. in both a vertical and a horizontal plane, making it adaptable for all classes of work.

The hydraulic drive principle, already in use on other Landis grinders, has been applied to these machines for furnishing power for the automatic table traverse. The oil reservoir is in the base of the machine, thus adding stability, and the oil is pumped from there to the reversing mechanism under the carriage. The pump is driven by a silent chain from the driveshaft in the base of the machine. A traverse speed of 6 to 360 in. per minute can be obtained, while provision is made whereby the carriage will tarry at the reversal point to permit indexing the work. If desired, this feature can be disconnected and the reversal will be automatic. The carriage can also be reversed by hand at any desired point when necessary.

The wheel head has been changed from the one used on the overhead-drive machines. The tapered bearings have been replaced with larger size cap bearings which are more easily adjusted and are more substantial, giving better support to the grinding wheel. Laminated shims are used under the caps, while the bearings are lubricated through a felt wick from a reservoir in the bottom section.

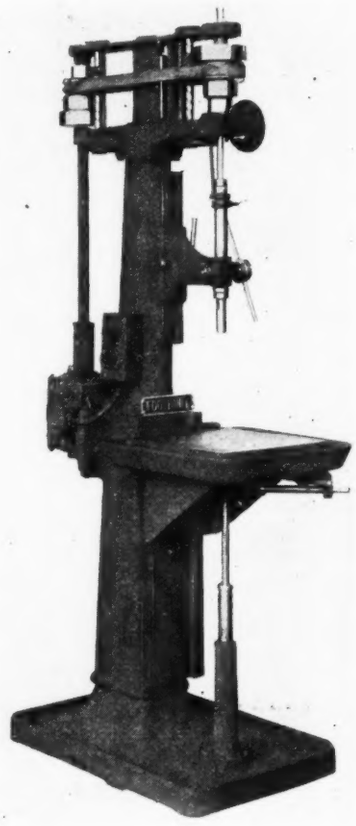
The machine can be operated from the front or from either side of the column in the rear. All control levers and handwheels are readily accessible from either position. The elevating and cross-movement handwheels are graduated in thousandths.

In respect to features other than those touched on in the above, the machine remains the same as previously. The No. 11 machine is for plain work only, and when desired the hydraulic feature may be omitted and the regular rapid hand feed substituted. The No. 12 machine is for universal toolroom work. A complete line of fixtures, attachments and wheels for use with these machines is being offered.

New Motor-Mounting for Drills

THE Foote-Burt Co., Cleveland, Ohio, has experimented for some time with various built-in motor drive arrangements, including the mounting of the motor directly on the spindle. The drive illustrated, however, has proved to be most satisfactory.

No gears are used in the drive. A constant speed motor is direct connected to the vertical driveshaft, on which a four-step cone pulley is mounted. The drive is then transmitted by an endless belt to the forward cone pulley, which is mounted directly on the spindle. Four speeds can be obtained — 544, 870, 1360 and 2180 r.p.m. This is said to be a wider range than is usually obtained



Footburt drilling machine, showing new motor mounting

Parts, Accessories and Production Tools

with variable speedmotors.

It is possible to change very quickly from one speed to another by turning the quick-speed-change lever. It has also been possible to retain the automatic idler pulleys, which have always been an important Footburt Sipp feature and which, by keeping the belt tight and pulling to capacity at all times, insure a smooth, steady drive.

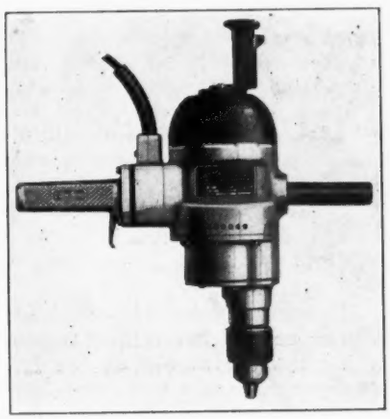
On multiple spindle machines, by staggering the mountings at the back of the machine, it is possible to keep the center-to-center distance of the spindles down to 8 in. This is impossible with motors directly on the spindle, because of the diameter of the motor itself.

The motors used are ¾ hp., 1800 r.p.m., standard vertical motors of the completely inclosed type. This new type of mounting is available on the largest size of Footburt Sipp sensitive drilling machine, which has a capacity of ⅞ in. in cast iron. It can be applied to one spindle or any number of spindles up to eight, and can be used on machines having an overhang of 8 or 12 in.

Drill Has Automatic Release

A HEAVY-DUTY, ball-bearing drill equipped with an automatic release safety catch is the latest development of The Van Dorn Electric Tool Co., Cleveland, O. This drill, which has a capacity for drilling up to ½ in. in steel, has hardened gears, threaded back chuck, and is powered with a Van Dorn Universal motor to operate on either A.C. or D.C. current.

No load speed is 550 r.p.m. while speed under load is 315 r.p.m. It weighs 16 lb. and its overall length is 16 in. Equipment includes combination space and breast plate handle, three jaw chuck and 10 ft. of cable with plug.



Van Dorn heavy duty, ½ in. electric drill

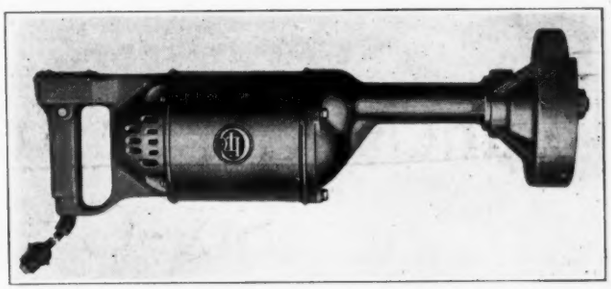
New "Husky" Wrench Tools

THE Husky Wrench Co., Milwaukee, Wis., has recently added a number of units to its line of small tools. Among them are four sizes of extra short screwdriver bits, three sizes of interchangeable socket screwdrivers, and four lengths of all-metal speed screw-driver handles. All units are designed for heavy duty work and can be used with other Husky handles. Swivel grips are provided on the speed screw-driver handles. The bits are hand forged of alloy steel, heat treated and nickel plated.

Other additions to the Husky line are three sizes of combination speed tees with 10 in. sliding handle bars and swivel grips; three sizes of speed tees with solid hexagon handles and swivel grips and a new type wrench handle with an offset handle which can be tilted to any angle to clear obstructions while working.

Portable Grinder and Buffer

THE Cincinnati Electrical Tool Co., Cincinnati, O., has brought out a new portable grinder and buffer powered with a ¾ hp. universal motor. It carries a 6 by 1 in. grinding wheel. Both the armature and spindle are mounted on ball bearings. Broad-



New Cincinnati portable grinder

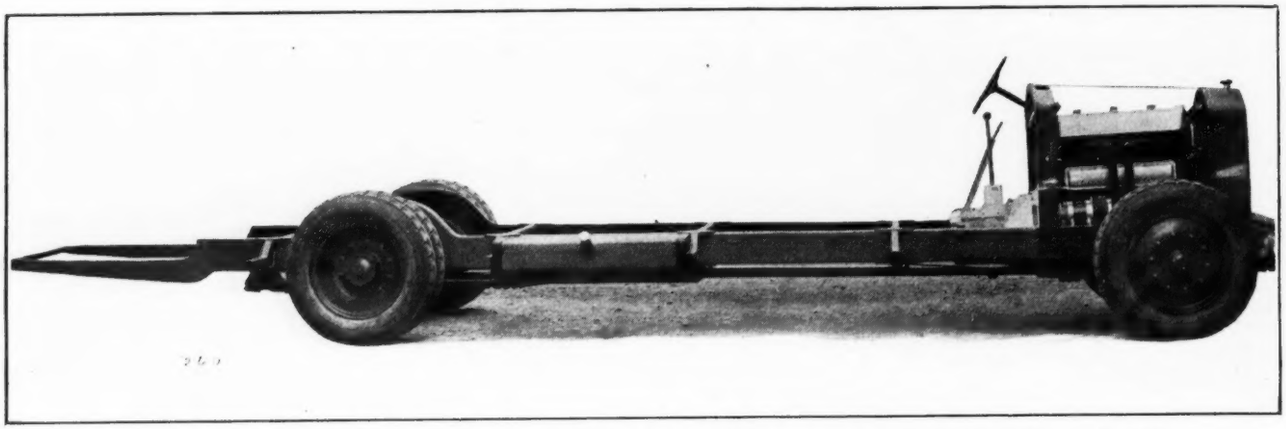
faced, heat-treated and hardened spiral gears are used throughout. The armature pinion is removable. The fully inclosed switch is located in the handle of the grinder with a push trigger under control of the operator at all times. A new feature is the cable clamp which secures the drop cord against movement and resulting wear. The weight of the tool is 24 lb. including wheel and guard. It can be furnished wound for 32, 110 and 220 volts for both direct and alternating current.

Wright R-1750 Airplane Engine

THE Wright "Cyclone," Model R-1750, airplane engine, which recently passed the Navy tests, has been designed to meet the demands of the Navy in heavy duty planes both where direct drive is required and where reduction gearing is advisable. The Cyclone is a nine-cylinder, radial, air-cooled engine which has developed over 550 hp. on test and has a specific weight of less than 1-1/3 lb. per hp. The bore is 6 in. and the stroke 6⅞ in.

The engine layout is clean and compact. The valve gear is inclosed and all accessories, including magnetos, oil pump, fuel pump, oil strainer generator drive, hand starter, synchronizer drive, etc., are grouped within a small circle on the rear section of the crankcase. The mounting is by means of drilled bosses on the intake manifold section of the crankcase. There are no external oil lines.

A gear driven rotary induction system provides approximately atmospheric pressure at the intake valves and can be geared up for various degrees of supercharging. The low specific weight of this new engine and its ability to operate at high speeds is expected to make it desirable for use in commercial planes of the larger types such as have been built in Europe around radial air-cooled engines of 450 to 500 hp.



Lancia six-cylinder, low-loading bus chassis with single reduction spiral bevel rear axle. The driveshaft is mounted diagonally and the differential is close to the left-hand wheel

Lancia Co. of Italy Building Low Six-Cylinder Bus

Has special low-speed engine, diagonal driveshaft with differential brought close to left driving wheel, single reduction rear axle and roller bearing spring shackles.

By W. F. Bradley

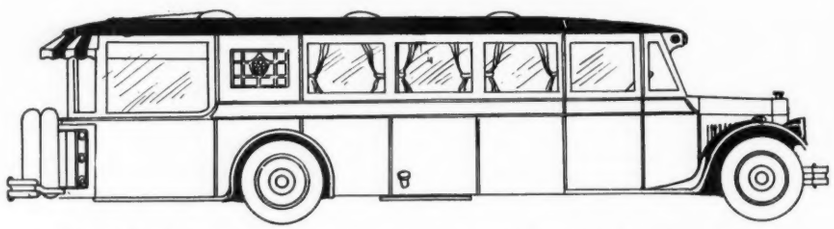
A DISTINCT departure so far as Italy is concerned, the Lancia Co. of Turin, has added to its line a six-cylinder, low-loading coach chassis designated the "Omicron" (Model O). Among its outstanding features are a special six-cylinder, low-speed engine, a diagonal driveshaft, the differential brought close up to the left driving wheel, a single reduction rear axle and Timken roller bearing spring shackles.

The Lancia weighs 6600 lb. in chassis form and is designed to carry a useful load (body included) of 17,600 lb. There are two chassis lengths, the normal being 211 in. and the extra long 217 in. When under load the top of the side rail is 25½ in. from the ground; wheel track is 73 in. and length available for body is 218 in.

A six-cylinder overhead-camshaft engine of 100 by 150 mm. (3.9 by 5.9 in.) bore and stroke is used. The crankshaft is carried in seven plain bearings and drives the overhead camshaft on the detachable head by two pairs of bevels. The engine has a high torque at low speeds and is throttled to 1200 to 1500 r.p.m. To diminish the side thrust on the cylinder walls, long I-section connecting rods are used; pistons are of aluminum alloy and lubrication is high pressure throughout, with the main supply of oil in the basechamber and a reserve tank recessed in the dashboard, and feeding automatically to the engine. A single Zenith carburetor is used, with a water jacketed manifold and an air filter. Magneto and electric equipment are Bosch.

Although clutch and transmission form a unit with the engine, the two can be removed separately without taking the engine out of the frame. There are four speeds and reverse with central change. The steering gear is the normal worm and wheel type fitted throughout with ball bearings and by reason of low pressure on the threads is exceedingly light to handle.

It is mounted on the frame member and to the bottom of the radiator shell, thus securing a considerable inclination of the column and bringing the wheel close up to the dashboard. The design provides for either left or right-hand steering. There are recesses in the dash, that on the right being used for the reserve oil tank and the gasoline vacuum tank, and the one on the left for receiving the pedals.



A coach of the observation type on the new Lancia six-cylinder, low-loading chassis

By making the differential shafts of un-

equal length and bringing the differential housing close up to the left-hand wheel, a low effective platform line is secured. The shaft is an open type, with three metal universal joints; the rear springs take both drive and torque. The axle is a full-floating type and is one of the few in Europe having a single spiral bevel reduction for a vehicle of this load capacity.

One of the features of the suspension system is the use of Timken roller bearings for the spring shackles. Instead of having a rolled eye, the ends of the main leaf are straight and are bolted to the shackle.

Both front and rear springs are under the frame members, and the latter are also under the axle housing. Tire equipment consists of Michelin straight sides mounted on steel disk wheels, the dimensions being either 985 by 205 or 40 by 8 in., single in front and dual in the rear. Internal expanding brakes on all four wheels are operated by pedal, and in addition there is another pair of shoes in the rear wheel drums operated by hand.

An unusual type of coach body produced by Lancia is a one-and-a-half decker. From the main floor two or three steps give access to a raised portion at the rear, having longitudinal and transverse seats and windows all round, giving an uninterrupted view. The space under this raised portion is made use of for carrying baggage.

A special one-and-a-half deck body, known as the "Belvedere" model, on the Lancia chassis

Competition From Italy

THAT American manufacturers of automobiles may expect to meet in the future still stronger competition in their export markets than they have in the past is very well illustrated by the progress which has been made during recent years by the Italian motor vehicle industry.

According to a recent report compiled by P. R. Mattix, of the Automotive Division, Department of Commerce, Italian manufacturers are adopting modern production and sales methods, are giving very close attention to the particular automotive needs of their foreign customers and, in general, are displaying a progressiveness which is sure to make them become an increasingly important factor in automotive markets abroad. This progress, which is particularly evident in Italy, appears to be going on also in other European countries so that their influence will increase in world automotive sales.

Lower-Priced Cars

Besides some very real developments in modern production methods, the Italian industry has been aided in recent years by the design of smaller and lower priced cars than it had been in the habit of producing, thus greatly widening the market for its products. Production of low priced cars had a beneficial effect upon the home market for Italian cars also which, previously, had absorbed but a very small portion of the total output. Economic conditions within the country are still such that possible home sales are relatively small but they are constantly increasing and will soon become a real factor in stabilizing production against fluctuations of demands in other countries.

The Italian industry is not in the best possible position financially, this condition being due largely, according to the Department report, to the necessity for extending long time credits in connection with a considerable proportion of foreign sales.

At the beginning of 1926 Italian producers looked forward to a notable increase in production by assuming that foreign business would account for at least 75 per cent of the total production. Exports did not come up to expectations, being only about 53 per cent of the total production of 65,000 cars, so that a rather large stock of cars was carried over into 1927 because of the inability of disposing of the large surplus at home.

Studying Local Market

The Italian makers seem to realize fully the importance of the competition they must meet in going after foreign trade and while they are taking steps to assure themselves that their products will have the best possible acceptance abroad, they are, at the same time, undertaking some serious studies with the view of opening up the Italian market for cars. During 1926 the excess of production over exports was about 30,000 cars while the domestic requirements at present would only account for about 15,000 or 20,000.

During 1925 Italian producers turned out 39,473 vehicles, of which 29,061, or 73.4 per cent, were exported. During 1926 production was about doubled, while exports to other countries increased only about 5000 to 34,194 units. A large proportion of the cars manufactured were small models selling from 15,000 to 20,000 lira or from about $580 to $780. Much of the increase of Italian exports for 1926 over previous years was probably due to the much lower prices. The average unit value of exports during 1926 was $808 as compared with $917 during 1925 and $915 during 1924.

Of the total 1926 production of 64,760 it is estimated that Fiat produced about 56,000 units or over 86 per cent. Fiat has been one of the leaders in the adoption and installation of modern production methods and equipment and this very large relative production is due in large measure to this fact.

The importance of various foreign markets to Italian makers has varied a bit during past years but nearby countries of Europe have usually held a very important place. Great Britain has held first place during the past three years while, during 1926, Germany climbed from sixth place to second. Australia, Switzerland, Spain and France are all important in the Italian export market while India and the Dutch East Indies are of prime importance outside the continent.

AUTOMOTIVE NEWS SECTION INDUSTRIES

Philadelphia, Pennsylvania

Saturday, May 28, 1927

Production Continues High; Curtailment Seen in June

PHILADELPHIA, May 28—Although the peak of motor car production has been passed, there has been as yet no material slowing up in the average output rate for the industry. Two large factories stepped up shipments during May and these gains will probably very nearly compensate for slowing up in some other quarters.

June, according to plans of leading producers, is expected to show a heavy curtailment, which will be due in some instances to new model plans and in others will be merely a seasonal move to bring down dealer stocks to a level in accord with the slower rate of sales which is normally encountered at this time of year.

New car stocks in dealers' hands are somewhat higher than at this time a year ago which may mean an acceleration of the seasonal downward trend in output. May and June schedules, however, make it plain that the second quarter of the year in point of volume will be ahead of the corresponding period a year ago for the group of producers exclusive of Ford. With Ford included, the second quarter of the year will show approximately the same reduction under 1926 levels that the first quarter's figures revealed.

On the whole the industry is well pleased with the sales developments of the year. A high rate of distribution has been maintained despite adverse influences, such as floods, tornadoes and the low buying power in some agricultural districts.

Automobile sales in the areas now affected by the flood have never been in very large volume. One important producer recently estimated that its sales losses as the result of flood conditions had been only 2000 vehicles.

J. P. Morgan Co. Increases Johns-Manville Holdings

NEW YORK, May 26—Johns-Manville Corp. has concluded an arrangement with J. P. Morgan & Co. under which the latter will obtain a substantial common stock interest in the Manville company, it was announced here today. This action follows the purchase of a large block of preferred stock by the Morgan company in December. H. E. Manville in his statement said he would continue as an officer and director. He said further no change in the policies of the company is contemplated.

It is not known whether the new stock purchase with its former preferred holdings will give the Morgan company control of Johns-Manville, but the financial district leans to the opinion that the Manville interests are preparing to retire from active business.

M. & A.M.A. Indexes Hold High Levels

NEW YORK, May 24—Parts, accessory and service equipment business in April, as reported to the Motor & Accessory Manufacturers Association by its members, was only slightly behind the March level, which was the highest since October, 1925. In line with the seasonal trend, a moderate recession is expected this month.

The aggregate volume of shipments of members in all groups in April stood at 175, an index figure with January, 1925, shipments as a base. This compared with 181 in March and 161 in April a year ago. A new record was scored by shop equipment manufacturers, while accessory makers continued their gains of the last few months. Original equipment and replacement parts shipments declined slightly from the March level, as was expected, because of seasonal influences.

Car Equipment Index 185

The index of shipments of parts and accessory makers for original equipment was 185 as compared with 195 in March and 160 in April last year.

Shipments of shop equipment manufacturers to the trade reached an index of 223 as compared with 210 in March and 208 in April last year. Accessory makers' shipments stood at 156 as compared with 135 in March and 176 in April last year. Replacement parts makers' business aggregated 117 as compared with 120 in March and 141 in April last year.

Westinghouse to Produce Devandre Vacuum Brake

NEW YORK, May 25—Albert Devandre, inventor of a vacuum brake well known in Europe, has just closed a contract with the Westinghouse Air Brake Co. of Pittsburgh for production of the brake in this country.

The brake, known as Cerveau Frein, is used on 43 of the leading European cars, including Minerva, English Daimler, Mercedes and Sunbeam.

Mr. Devandre sailed for Europe today.

20 Nations Gather for Trade Sessions

DETROIT, May 26—More than 2000 persons representing the business interests of 20 nations are assembled in Detroit for the 14th Annual Foreign Trade Council which opened today for a three-day session. Among the speakers Thursday is Roy D. Chapin, chairman of the board of the Hudson Motor Car Co., and president of the National Automobile Chamber of Commerce, whose topic is "The Motor Influence in Our Foreign Trade."

A.E.A. to Establish Salesman's Course

CHICAGO, May 24—Arrangements have just been completed by the Greater Market Development Division of the Automotive Equipment Association for the establishment of a training course in automotive merchandising.

This course, designed for jobbers' salesmen and the retail trade, will cover all phases of automotive sales and service as they affect the aftermarket. It is one of a series of services planned as part of the greater market development work.

A contract has been entered into with a leading concern specializing in the development of business training courses and preliminary work already is under way. During the next 60 days over $25,000 will be spent in a survey of automotive selling. As a result of this survey, the most approved practices and methods of successful retailers in all sections of the country will be made available for every dealer and every salesman interested in building for greater profit.

Laminated to Add Heater

NEW YORK, May 24—Laminated Shim Co., of Long Island City will announce shortly the addition of a heater. It is understood that the heater employs a new principle so far as automotive practice is concerned. The heater will be made for all makes of cars.

Reo Building 250 Daily

LANSING, May 21—The Reo Motor Car Co. passenger car production is running between 225 and 250 a day, which is four times the production in May, 1926. Reo shipments during the first 10 days of May exceeded shipments for any single month in 1926.

New Light Car Ready Soon Ford Statement Declares

Details of New Model to be Made Public in Few Weeks, Says Henry Ford — Model T Seen Continued as Pioneer

DETROIT, May 26—A formal statement by Henry Ford and Edsel Ford, issued today, says that the Ford Motor Co. will put a new light car into early production, the details of its design to be made public within the next few weeks. The statement leaves the question as to whether the new car will succeed the Model T or supplement it somewhat in doubt.

In one part of the statement Henry Ford is quoted as saying:

"We began work on this model several years ago. In fact, the idea of a car to succeed the Model T has been in my mind much longer than that. But the sale of the Model T continued at such a pace that there never seemed to be an opportunity to get the new car started. Even now the business is so brisk that we are up against the proposition of keeping the factory going on one model while we tool up for another."

Mr. Ford's only official word on the new car was:

"At present I can only say this about the new model—it has speed, style, flexibility and control in traffic. There is nothing quite like it in quality and price. The new car will cost more to manufacture, but it will be more economical to operate."

Explaining why the company is offering the new model Mr. Ford said:

U. S. Conditions Changed

"The Model T Ford car was a pioneer. There was no conscious public need of motor cars when we first made it. It is still the pioneer car in many parts of the world which are just beginning to be motorized. But conditions in this country have so greatly changed that further refinement in motor car construction is now desirable and our new model is a recognition of this.

"With the new Ford we propose to continue in the light car field which we created on the same basis of quantity production we have always worked, giving high quality, low price and constant service."

On its face, the statement indicates that the Model T will be continued largely for pioneering in various parts of the world, with some considerable volume of business continuing in the United States. It also is believed that the modified Model T chassis will continue to be the main truck unit of the company, these two factors alone giving a large sized volume.

Sources close to the company indicate that the new model will have a standard gear shift. It also is considered likely that the Model T will incorporate many of the refinements of the new car though continuing the planetary gear shift. For some time it has been generally understood that Ford engineers were refining the four-cylinder engine, and reports have indicated that among the changes will be the installation of a distributor ignition system in place of the conventional Ford flywheel magneto. It is also understood that the engine may be equipped with oil and water pump along with other refinements.

Expect Lower Built Car

New body lines are understood to be included and the car will probably hang closer to the ground. Radiator shells, similar in design to the Lincoln shells and about 3 in. wider and 3 in. higher than the present Ford design, are reported under development in the Highland Park plant. There have also been conflicting reports on the wheelbase, but the industry is taking it for granted that the new car will have a longer wheelbase than its predecessor.

Production on the new model will get under way with only minor disturbance of the regular working schedule of the company, Henry Ford said.

Durant of N. J. Increases Stock to 2,700,000 Shares

NEW YORK, May 26—Durant Motor Co. of New Jersey filed with the Secretary of State an amended certificate increasing its authorized capital stock from 80,000 shares of no par common to 2,700,000 shares. Of this 2,000,000 shares are to be no par common and 700,000 shares, $7,000,000, is to be 6 per cent cumulative preferred stock.

The charter provides that each share of common capital stock now outstanding shall have a paid-in value of $120 a share to be exchanged for 12 shares of no par common. Holders of preferred stock when issued can exchange it up to May 1, 1928, on the basis of 2 shares of preferred for one share of common. After Jan. 1, 1929, preferred stock par $10 a share may be redeemed by the corporation at $12.50 a share.

Chevrolet May Total 114,000

NEW YORK, May 25—W. S. Knudsen, president of Chevrolet Motor Co. sailing yesterday on the Reliance for a pleasure trip abroad, said that May schedule of the Chevrolet division calls for 114,000 vehicles, including 18,000 commercial cars. April production totaled 111,937, which exceeded the best previous month by 4037.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co.*

NEW YORK, May 26—There has been a slight gain in activity in some important industrial lines, and a moderate improvement in retail trade. Wholesale business, on the other hand, continues to decline moderately. On the whole, business appears to be following a normal seasonal course, with no indication of recession other than that which usually appears at this time of year. Weather conditions improved somewhat last week. Both stock and commodity prices advanced, while money rates remained easy.

FREIGHT CAR LOADINGS

Railway freight loadings exceeded the million-car level for the fifth time this year during the week ended May 7. The total was 1,024,416 cars, which compares with 1,026,440 cars in the preceding week and 996,216 cars in the corresponding period last year. Loadings for the year to date number 18,280,240 cars as against 17,770,207 cars a year ago and 17,476,346 cars two years ago.

BUILDING CONTRACTS

Construction contracts awarded last month in 37 states, according to the F. W. Dodge Corp., had a total value of $604,390,700. This is 3 per cent less than the record figure of March and 6 per cent above that of April last year.

BANK DEBITS

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended May 18 were 5.1 per cent above the total for the preceding week and 13.6 per cent above that for the corresponding period last year.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices stood at 140 last week, as against 139.6 a week earlier and 139.5 four weeks earlier.

FEDERAL RESERVE STATEMENT

Bills and securities held by the Federal Reserve banks increased $23,900,000 during the week ended May 18, gains of $16,200,000 in discounts and $15,200,000 in holdings of Government securities being partially offset by a decline of $7,600,000 in open market purchases. Note circulation declined $7,000,000 and reserves $11,200,000, while deposits increased $27,600,000. The reserve ratio declined from 80 to 79.3 per cent.

During the same period, loans of reporting member banks increased $11,000,000, with a gain of $57,000,000 in security loans largely offset by a decline of $46,000,000 in "all other" loans. Investments rose $73,000,000, borrowings from the Federal Reserve banks $17,000,000, net demand deposits $19,000,000 and time deposits $41,000,000. Loans to brokers and dealers, secured by stocks and bonds, made by reporting member banks in New York City increased $16,000,000.

Production Totals Indicate Ford April Output 100,000

Canadian Total of 24,611 Swells Output by American Factories for Month to 422,177 as Compared With 409,464 in March

PHILADELPHIA, May 25—Combination of the Canadian car and truck production totals for April with those of United States manufacturers shows a gross total for the month of 422,177 which compares with 452,025 for April, 1926. In March, this year, the combined production for manufacturers in both countries totaled 409,464.

The Canadian totals in April, this year, showed passenger output of 20,890 and truck output, 3721. In April, 1926, these totals were 17,929 and 3573 respectively. In March, this year, the totals were 19,089 and 3534. The United States totals, while showing an increase of 11,396 in cars and a decrease of 671 in trucks compared with March, show decreases of 30,836 passenger cars and 2121 trucks compared with April, last year.

Deduction of the production total of 323,143 as set up by manufacturers of cars and trucks affiliated with the National Automobile Chamber of Commerce in April indicates a production of 99,034 for Ford Motor Co. and non-affiliated truck companies in April. This figure will be increased slightly by later reports from truck companies. With allowances for the delayed reports it is evident that the Ford production in the United States and Canada was close to the 100,000 mark.

Foreign Plants Increase Total

Though the Ford estimated totals indicate a considerably reduced rate of operation in the United States plant from the totals it was setting up in 1924, the rate is considerably higher than had been estimated in many quarters. This is especially the case when it is remembered that a large part of the company's export business resulting from assemblies abroad is not included in these totals.

The Chevrolet April total of 111,937 indicates an approximate excess of 12,000 over the Ford total production in United States and Canadian factories. As in Ford's case the Chevrolet total does not include cars assembled abroad but as the Ford export assembly plants considerably outnumber the Chevrolet plants the world totals of the two companies would in all probability show the Ford company still leading in actual number of units produced.

Four Months Total Shows 12½% Decline

	Cars	Trucks	Total
1926			
Jan.	284,703	33,517	318,220
Feb.	334,524	41,784	376,308
March	399,105	49,386	448,491
April	401,836	54,135	455,971
Total	1,420,168	178,822	1,598,990
May	394,569	51,568	446,137
June	358,388	47,265	405,653
July	329,959	41,873	371,832
Aug.	393,064	47,836	440,900
Sept.	363,547	51,257	414,804
Oct.	300,160	46,985	347,145
Nov.	226,278	39,430	265,708
Dec.	143,413	30,161	173,574
Total	3,929,546	535,197	4,464,743
1927			
Jan.	208,731	40,873	249,604
Feb.	275,467	41,947	317,414
March	360,764	48,700	409,464
April	373,961	48,216	422,177
Total	1,218,923	179,736	1,398,659

Fisher Plans Paint Shop

DETROIT, May 23—A paint shop to cost $250,000 will be erected at Pontiac by the Fisher Body Co., as an addition to its factory in that city. The building will be 75 by 608 ft.

Packard Spends $1,250,000 to Cut Yearly Coal Bill

DETROIT, May 23—The Packard Motor Car Co. is expending $1,250,000 in the expansion of its power house. The program includes a complete new heating system for the factory, a 6000 kilowatt steam turbine and dynamo, a new 1200 horsepower boiler and a system for burning wood refuse.

Power will be a by-product of the new heating plant. The new boiler will provide 3,000 boiler horsepower and deliver steam to the turbine at 325 lb. pressure. Exhaust steam at 85 lb. pressure will be led through a high pressure 24-in. pipe more than a half-mile to the forge shop, eliminating the separate powerhouse. Steam at atmospheric pressure will be used for the forced hot water heating system.

All wood pieces, shavings and sawdust will be collected from the factory and carried to the powerhouse in a 24-in. pipe line under air pressure where they will be ground up and delivered to two 500 hp. wood-burning boilers in the form of sawdust. With this new equipment Packard expects to save 12,000 tons of coal annually.

Corsair Speeds 130.93 m.p.h.

WASHINGTON, May 24—The Navy Vought "Corsair" observation seaplane, equipped with a 500 hp. Wasp air cooled motor, set a new world's speed record of 130.93 m.p.h. for 1000 kilometers at Hampton Roads, Va., it was announced by the U. S. Navy Department this week. The previous record for the distance was 103.372 miles per hour, set in Italy by A. Pasaleva. The Vought was piloted by Lieut. Rutledge Irvine. This same plane during the past three weeks also established an altitude record for seaplanes of 22,178 ft., a "load" speed record of 147.263 for 100 kilometers while carrying 1102 lb. load, and a 500 kilometer speed record of 136.023 m.p.h.

Apco and Mossberg Combine Interests

NEW YORK, May 24—Apco Mfg. Co. has completed arrangements for the purchase of the Frank Mossberg Corp., of Attleboro, Mass., the two companies to be merged in a new company known as the Apco-Mossberg Corp. Announcement of the deal was made by T. F. Wilson, president and treasurer of Apco, who will continue in the management of the new company assisted by the most able executives of both organizations.

Both of the merged companies have long been favorably known in the automotive industry. The Apco company dates back to 1909 when it was founded by Mr. Wilson as the Auto Parts Co. Mossberg has been a leading factor in the automotive wrench business for 25 years. The combined sales of the companies approximates $2,000,000 a year.

Combined assets of the Apco-Mossberg company will be close to $2,000,000. No new financing is contemplated in connection with the merger, the entire transaction being handled through an exchange of securities. Many parts bought by Apco previously will now be manufactured in its acquired plant. Several new items also will be added to the line. For the present operations will be continued at both Attleboro and Providence.

Stockholm Turns to Buses

WASHINGTON, May 24—Two street car routes have been removed from Stockholm, Sweden, and supplanted by bus lines operating nine buses of Swedish manufacture, the U. S. Department of Commerce has announced. Swedish state railroads are taking steps to meet competition of motor trucks which have taken as much as 70 per cent of the railroad light freight business.

Czech Cars Exceed Imports

WASHINGTON, May 23—Automobile production in Czechoslovakia during January and February totaled 280 passenger cars, 443 trucks and 136 motorcycles, it was reported to the U. S. Department of Commerce. These are the first automobile production figures to be made public in Czechoslovakia. It is estimated that the total 1926 production of cars and trucks totaled 7000. Imports during the first two months of this year were 232 automobiles, 161 trucks and 63 motorcycles.

Faroux Says Front Drives Next Big Automotive Step

NEW YORK, May 21—The principal points in which present-day American cars excel those of European manufacture are the silence of their gears, their flexibility and their body work, in the opinion of M. Faroux, editor and publisher of *La Vie Automobile*, who sailed this week for Europe after spending six weeks visiting American factories.

M. Faroux was tendered a luncheon by National Automobile Chamber of Commerce officers on the eve of his sailing. Those attending in addition to representatives of American automotive papers were Alfred Reeves, general manager of the chamber; H. O. Smith, chief of the automotive division of the Department of Commerce; H. H. Kelly, Paris representative of the Department of Commerce; Coker Clarkson, general manager of the Society of Automotive Engineers; Harry G. Bragg, New York Automobile Merchants Association; Robert Reeves, Commercial Investment Trust Corp., and John C. Long, Russell Huffmann and John V. Lawrence of the Chamber.

Would Improve Foremen

Impressions of his factory tour as given by M. Faroux were entirely favorable to American methods as compared with those employed in the French plants. He was particularly impressed with the cooperation existing between workmen and their superiors. "Most French engineers returning from inspections of American factories bring with them the thought we must educate our workmen," said M. Faroux. "I shall bring with me the thought that we must educate our foremen."

The class condition in France, he declared, continued to be the most serious obstacle to large volume sales. The driving of automobiles by women was just starting. Sales on time are being undertaken but without the assistance of banks even in so far as rediscounting automobile paper. All of this business is in the hands of financing companies with limited capital.

The French viewpoint generally is opposed to sales involving deferred payments. French buyers like to pay cash, M. Faroux said, adding that only the peasants have cash now and they will not spend because of the heavy taxes. Contrasting the spirit of America and of Europe in automotive terms, he said—"America generally has its foot on the accelerator—Europe has its foot on the brake."

Must Stand Long Runs

In France the principal objection to American cars is that they fail to stand up under heavy driving conditions, M. Faroux said. Citing the run from Paris to Bordeaux as typical he said French owners have found American cars failing to meet the fast driving possibilities over long distances that such a run affords. Later model American cars with high speed engines are overcoming this objection, he said.

Adopting a prophetic vein to respond to a question as to what he thought would be the next important development in automobile design, M. Faroux said he looked for the introduction of improved front wheel drives as standard equipment on many cars. Many experiments on front wheel drives are being made secretly at the present time by European manufacturers.

Sailing for France, M. Faroux said he was carrying with him a very deep appreciation of the kindness of American manufacturers. Everything that he came to see was shown him. He contrasted this open attitude with the secrecy surrounding most European plants, this aloofness continuing to make difficult though not actually obstruct the development of the French automotive engineering society.

Trecker Cites Importance of Machine Tool Industry

MILWAUKEE, May 23—"Motor cars would be prohibitive in price if it were not for the machine-tool industry," said Theodore Trecker, president of the Kearney & Trecker Corp., Milwaukee, in an address before the Milwaukee Rotary Club. The well-known manufacturer of milling machines talked on "The Machine Tool Industry." "No quantity production would be possible without machine tools—the master tools of industry," he said. "Most people do not realize the importance of this industry in its relation to other industries. It has grown tremendously and is steadily decreasing production costs in other lines, particularly those in which metals are utilized."

Studebaker Forms Branch

PARIS, May 14 (*by mail*)—The Studebaker Corp. of America has organized its own selling organization in France under the title Societe Anonyme des Automobiles Studebaker, with headquarters at 110 rue des Arts, Levallois, near Paris.

The French branch is under the management of Rene Petard. For the last two years the Studebaker distributor in France has been Blake Ozias, who has traded under the name Sadeo. It is because Ozias has severed his connection with the company, in order to devote himself to the manufacture of automobile hardware, that Studebaker has been led to form its own company.

900 Members Gather for S.A.E. Sessions

FRENCH LICK SPRINGS, IND., May 26—More than 900 members registered here yesterday at the opening of the four-day Summer Meeting of the Society of Automotive Engineers. A rainstorm broke up the sports program late in the afternoon but most of the preliminaries had been finished when the downpour came.

At the election of members-at-large for the nominating committee, which was one of the important events of the opening day, S. B. Stevens, F. M. Germaine and Walter Keys were chosen to join with the following section members in nominating officers for next year: Buffalo Section, John C. Talcott; Chicago Section, O. W. Young; Cleveland Section, O. A. Parker; Detroit Section, L. M. Woolson; Indiana Section, F. F. Chandler; Metropolitan Section, S. R. Dresser; Milwaukee Section, William S. Harley; Pennsylvania Section, C. O. Guernsey; Southern California Section, E. B. Moore; Washington Section, A. W. S. Herrington.

Adopt Standards Report

At the evening business session the recommendations of the standards committee were adopted with few changes. The sections committee met and discussed various ways of improving and making more valuable the various section activities. The Buffalo Section was shown to have more members enrolled in proportion to society members in the territory than any other section. New England was second in this respect, and Indiana third.

The treasurer's report showed a balance of assets of the society over liabilities of $194,435.

J. H. Hunt, president, was chairman of the general session which featured the program last night. At this session papers were read by Dr. E. F. Barker, University of Michigan, on "The Structure of the Atom"; J. J. Grabfield, General Motors Research Corp., on "The 1937 Automobile," and Dr. C. H. Robertson on "Economic Conditions in China." Mr. Grabfield's paper was originally presented before the Detroit Section and was the prize-winner in the recent competition for the $100 Woolson award.

Sao Paulo to Buy Trucks

WASHINGTON, May 21—Municipal authorities in Sao Paulo, Brazil, have requested the U. S. Department of Commerce for information relative to motor sprinklers and garbage disposal trucks. Interested American manufacturers are urged to forward information to the office of the Trade Commissioner at Caixa Postal 2817, Rua Libero Badaro, 133-6 andar, San Paulo, Brazil.

Men of the Industry and What They Are Doing

New U.S. Chamber Head Widely Known Executive

Lewis E. Pierson, new president of the United States Chamber of Commerce, is the first New York executive to be elected to this position. As chairman of the board of the American Exchange Irving Trust Co., Mr. Pierson is most widely known as a banker, but his interest in general business affairs has taken him into many fields.

He has been active in the affairs of the Merchants Association of New York for many years, serving as first vice-president in 1917, and as president in 1922-23. He was president of the New York Bankers' Association in 1903 and in 1909 became president of the American Bankers' Association at the age of 39—the youngest president the association has ever elected.

Among other contributions to general business and banking, Mr. Pierson was identified prominently with the development of the uniform bills of lading and banking acceptances. He also has taken active interest in the affairs of the Foreign Trade Council and more recently in the activity of the International Chamber of Commerce, being a member of the executive committee of the American section.

Mr. Pierson comes of an old American line, his first American ancestor coming to this country in 1639. The early years of Mr. Pierson were spent at Metuchen, N. J., where he was born on a farm. Starting with the Hanover National Bank of New York he worked his way up through the various grades of the banking profession, until in 1904, when 33 years old, he became president of the New York National Exchange Bank.

Baker Heads Akron Club

H. R. Baker, advertising manager of the Miller Rubber Co., is the first president of the new Akron Advertising Club. The charter membership of the club embraces representatives of practically all the tire manufacturing companies in the Akron district.

Brisbin Back from Trip

Don S. Brisbin, general sales manager of the Columbus McKinnon Sales Co., has returned from a two months' trip among the distributing agencies on the Pacific Coast.

Cullinan Heads Jobbers

George E. Cullinan, vice-president in charge of sales of the Graybar Electric Co., has been elected chairman of the Electrical Supply Jobbers Association.

Republic Names Spencer

R. H. Spencer, of Los Angeles, has been appointed southwest zone manager for the Republic Motor Truck Corp.

Chrysler in Boston Talks on Hard Work

Walter P. Chrysler, slipping over to Boston to pay a visit to his son at school there, dropped into the salesrooms of the C. E. Fay Co., his distributor, and after chatting with Allen Fay agreed to give a talk to the organization. The men assembled and when Mr. Chrysler looked them over he had a merry twinkle in his eyes.

He told them that they were not going to hear any high pressure talk about salesmanship; that if they were not salesmen they would be working at some other trade. Then he talked about hard work, what it accomplishes, and how much one gets out of it. He gave some examples of people who managed to get ahead through sheer hard work which brought out their abilities because they had persistence and determination. When Mr. Chrysler finished he answered some questions for the men.

Chapin Honors Parent

As a memorial to his father, the late Edward G. Chapin, of Lansing, Roy D. Chapin, chairman of the board of the Hudson Motor Car Co. and president of the National Automobile Chamber of Commerce, has announced that he will erect a wing on the Edward W. Sparrow Hospital in Lansing. The project will cost $75,000.

Wisdom Joins Elcar

P. W. Wisdom has been appointed western sales manager of the Elcar Motor Co. and is now at work on the Pacific Coast. Mr. Wisdom is well known among the dealers of the far western states and the factory reports a very favorable volume of shipments being made as result of his endeavors.

Sales Executive in U. S.

Henri Stakgold of Corneliussen & Stakgold, automotive manufacturer representatives at Oslo, Norway, with offices at 44 Whitehall St., New York, is in the United States to arrange for the representation of additional American built products in the European field.

Sheridan to Sell Timer

R. M. Sheridan, manufacturers' representative, with headquarters in Chicago, has been appointed Central West sales representative for Milwaukee Motor Products, Inc., makers of Milwaukee timers.

Akron Executives Obtain Lambert Tire & Rubber

An Ohio corporation headed by George Seiberling, J. P. Seiberling and J. W. Coyle, has taken over the Lambert Tire & Rubber Co., formerly an Arizona corporation. George Seiberling, formerly factory manager of the tire companies controlled by the United States Rubber Co., is the new president and general manager. From 1903 to 1920 he was connected with the rubber firm of Morgan & Wright in Chicago and Detroit. J. P. Seiberling is a son of Frank A. Seiberling, a leader in the rubber industry for years.

The Lambert Company first engaged in the manufacture of cushion and so-called puncture proof tires, and later entered the pneumatic tire manufacturing field.

Alford and Lee Speakers

W. H. Alford, vice-president and financial expert of the Nash Motors Co., was the guest of honor and principal speaker at the annual banquet of the College of Business Administration of Marquette University, Milwaukee, on May 19. At the annual banquet of the Marquette University Engineering Association, the guest speaker was Maj. Robert E. Lee, secretary-manager of the St. Louis Automotive Dealers' Association.

Stanton on Export Trip

Donald T. Stanton, director of export sales for Dodge Brothers, Inc., has left for a three months' business trip to Europe.

James Warren Lane

NEW YORK, May 23—James Warren Lane, president of the E. W. Bliss Mfg. Co., manufacturer of machine tools, died suddenly of heart disease yesterday at his home in St. James, Long Island, N. Y. He was 62 years old. Under his leadership the Bliss company, after a period of munitions production during the war, has pursued a steady policy of conservative expansion of its machine tool business and allied lines. The company's sales to the automotive manufacturers have been heavy.

Walter R. Green

CHICAGO, May 21—The death of Walter R. Green, president and general manager of the International Stamping Co., this city, on May 12 was announced this week by the company.

William D. Morse

CORTLAND, May 21—William D. Morse, for many years general sales manager and a vice-president of Brockway Motor Truck Corp., died this week.

Robert C. Graham **Joseph B. Graham** **Ray A. Graham**

Widely known executives whose purchase of control of Paige-Detroit Motor Car Co. was approved this week by stockholders

Paige Unanimous for Graham Sale

DETROIT, May 25—At a special meeting today, stockholders of the Paige-Detroit Motor Car Co. approved the plan whereby the Graham Brothers are to acquire control and take over active management. The vote of the stockholders present and stock represented by proxy was unanimous. The plan cannot become effective for about two weeks until certain important details are completed, including the obtaining of necessary waivers from the common stockholders whereby the Grahams can be permitted to purchase $4,000,000 par value second preferred stock and be given an option to purchase additional common stock in connection with their proposed management contract.

W. A. Wheeler, president, said, "The response of our stockholders has been splendid. We hope the small percentage who have thus far failed to send in their waivers will do so immediately so this plan, which means so much for the Paige company, can be made effective without delay."

Tom O'Brien is Named Duplex Sales Manager

DETROIT, May 25—The Duplex Truck Co. of Lansing announces the introduction of a complete new line of trucks and the appointment of Thomas T. O'Brien as general sales manager. The new line comprises ton and one-half, two-ton and three-ton trucks with four and six-cylinder engines. The four-wheel drive Duplex, which the company has manufactured for 20 years, is being continued with many refinements.

Mr. O'Brien is well-known in the industry, having served eight years in the sales division of Overland when it manufactured the Garford truck. Later he was head of truck sales for Oldsmobile when it was in the commercial car field. When Olds discontinued this line, he became assistant sales manager of the company and later joined the sales department of Reo. He is widely known in the industry and to dealers throughout the country.

Racine Radiator to Move to Milwaukee

MILWAUKEE, May 23—The Racine Radiator Co. has purchased a 5½-acre site in Milwaukee and will build a complete new plant and office building costing about $150,000. The present plant in Racine will be abandoned and the equipment moved to Milwaukee when the new plant is ready.

The transfer is being made so that not only will extensive Milwaukee users of Racine radiators get quicker service, but advantage will be taken of the daily cross-lake boat service between Milwaukee and west coast Michigan ports to give more prompt service to Detroit and other Michigan users. Contracts have been let for the new works, which will be 125 x 462 ft., of brick and steel, with a two-story section, 30 x 150 ft. for offices.

AC Opens Five Offices

DETROIT, May 24—The AC Spark Plug Co. has opened district sales offices at five important points throughout the United States to insure closer field supervision and co-operation between the factory and its distributing outlets. The offices and their respective managers follow: New York, J. C. Hines; Atlanta, A. S. Holmes; San Francisco, J. E. Stone; Kansas City, V. J. Snively, and Flint, O. B. Letts.

Eaton Assets $9,229,594

CLEVELAND, May 24—Consolidated statement of Eaton Axle & Spring Co. as of April 30, 1927, shows total assets of $9,229,594 and surplus of $7,085,907. Total current assets, including cash and Liberty bonds, are $3,827,654; total current liabilities are $1,049,192.

Three-Control Truck New Detroit Product

Will be Made by Divco-Detroit Company in Former Gemmer Plant

DETROIT, May 24—The Divco-Detroit Corp. has been organized here to manufacture a three-point control truck designed especially for milk and other deliveries in which frequent stopping is necessary. The truck, known as the Divco, was developed by G. M. Bacon. It is driven by a four-cylinder Continental engine with controls and steering apparatus at the front and both sides.

The new corporation is headed by Carl H. L. Flintermann, with C. R. Norton, directing vice-president; G. M. Bacon, vice-president, and Don M. Ferguson, chief engineer. Other officers and directors will be announced later.

The company has taken over the plant on Merrick Ave., formerly occupied by Gemmer Mfg. Co. and is making plans for large production to be under way in July. The trucks have been in experimental use by dairies in several parts of the country and are reported to have developed a considerable volume of orders.

The officers of the company are well-known in the industry.

N.A.C.C. Dates Meetings for Service and Ad Men

NEW YORK, May 24—A meeting of the service managers of the National Automobile Chamber of Commerce is to be held June 14 and 15 in Cleveland. An extensive program is being prepared but all the speakers have not yet been named.

Among the topics selected for discussion are: Handling of Replacement Parts Shipments; How Should Shop Equipment be Distributed; Training the Service Personnel; Results of Increasing Adoption of Flat Rate Systems, and Bonus Payments for Mechanics.

Advertising managers of the chamber will meet June 23 and 24 in Detroit.

Kelsey-Hayes Plan Set for Immediate Operation

NEW YORK, May 26—Terms of the merger of Kelsey Wheel Co. and Hayes Wheel Co. were formally ratified by Kelsey stockholders at a meeting today and steps will be taken immediately to put the plan into operation. The new company will be known as the Kelsey-Hayes Wheel Co. Election of two additional directors was authorized. The new directors will be men now associated with the Hayes company. The same operating personnel will be maintained with G. W. Kennedy continuing as president.

Singer and Daimler in British Merger

Deal Awaits Stockholders Action—Would Double Low-Priced Output

LONDON, May 10 (*by mail*)—At a special meeting of the shareholders of Singer & Co. held today the chairman announced that if the shareholders authorized an increase of capital from £500,000 to £1,000,000, as the directors asked, a provisional contract entered into with the Daimler Co. would be carried out. This contract will result in a close working agreement between the two companies; the purchase outright by Singer of a new plant and equipment recently completed by Daimler but not yet used, the lending of £150,000 to Singer by Daimler on a note of acknowledgment without security; the taking up by Daimler of a big batch of the new shares, the underwriting by Daimler of a large proportion of the additional issue of capital and the appointment of a Daimler director as Singer executive.

It was said that this arrangement would result in an immediate increase of output of the Singer company, which is at present unable to cope with the demand for its light cars; the latter include the 8 hp. four-cylinder four-passenger introduced at Olympia last year at approximately £150, the 10 hp. model that has been the standard product for many years past, and the 14 hp. six-cylinder selling at £325 as an open four-passenger and £350 as a sedan. The present rate of output from several separate plants in Coventry is 10,000 a year. This will be doubled within a year it is said, by the acquisition of the Daimler plant at Birmingham.

Earned £122,000 in 1926

The Singer company has been one of the most successful of British automobile concerns for many years past. The original capital in 1909 was £50,000 and without any call on the shareholders or public it has been raised progressively to £500,000 in 1926 (with 166,620 shares still unissued) by the issue of bonus shares. The profits have increased by stages from an average of £26,000 a year for the eight years ended July 1917 to £122,000 last year. The £1 shares are now quoted at over £3 and the new ones will be issued (at a price not yet announced) to existing shareholders at the rate of five for every six now held.

The Daimler company is the oldest British motor manufacturing concern and handles high-grade Knight-engined cars exclusively, all sixes except for the new 12. This company recently joined forces with the owners of the company producing A. E. C. trucks and London buses, forming a new company known as the Associated Daimler Co., Ltd. The parent concern will in future be interested therefore in the sale of all types of automobiles from an 8 hp. light car to buses and trucks of all sizes.

British Imports Gain in Quarter

WASHINGTON, May 23—British imports of all classes of motor vehicles except commercial types during the first three months of this year have been considerably larger than during the same period last year, the American consulate at London has advised the Bureau of Foreign and Domestic Commerce.

Touring cars, tractors and motorcycles were more than double in number and chassis recorded increases. Imports during the past quarter were as follows: Touring cars, 5972; commercial vehicles, 81; tractors, 258; chassis, 3762, and motorcycles, 44. Corresponding figures for the first quarter of 1926 were, touring cars, 2669; commercial vehicles, 358; tractors 53; chassis, 3243, and motorcycles, 21.

Republic Adds Distributors

DETROIT, May 21—Four new distributors in Europe and one in Morocco have been added to the overseas distributing organization of the Republic Motor Truck Corp. during the past month. The new distributors are: Baeza Hermanos, Ceuta, Morocco; Alfred Kellner Autohandels Aktiengesellschaft, Budapest, Hungary; Schmidt's Automobiel en Motorenhandel, Midden-Beemster, Holland; Autola O/Y, Helsinki, Finland and Orey, Ltda., Lisbon, Portugal. According to E. J. Demaray, export sales manager, there is a marked increase in the activity of the truck market in the entire world.

New Spanish Tax to Build Highways

Rates are Fixed on All Classes of Vehicles Based on Horsepower

WASHINGTON, May 25—A Spanish royal decree of April 29, effective July 1, 1927, establishes a single circulation tax on automotive vehicles and cancels all other forms of automobile taxation, the U. S. Department of Commerce was notified this week.

Privately owned automobiles must pay 33 pesetas per horsepower, minimum basis, 5 hp. per year; taxicabs 36 pesetas per horsepower, 5 hp. minimum; motorcycles without side car 16.50, with side car 20, minimum 3 hp.; buses carrying a minimum of 15 passengers, 874 pesetas per horsepower and 1558 pesetas additional per seat; trucks 515 pesetas per ton capacity, and unused vehicles 50 per cent of these rates. The money will be distributed for construction of highways by municipalities and provinces and by the central government.

French Taxes $20 a Car

WASHINGTON, May 21—French motorists are paying an average license tax of $20 a year on their cars, even on the tiny 5 hp. machines, according to an estimate based on figures for government taxes, the U. S. Department of Commerce has been informed. In 1926 these taxes amounted to $18,485,000 on 910,000 motor vehicles, including passenger cars, trucks, cyclecars and motorcycles.

G.M. Truck Opens Branch

CINCINNATI, May 21—General Motors Truck Corp., has taken over the Ratterman Motor Service Co., and will operate it as a factory branch. For the past 17 years Charles Ratterman has been handling the sales of G. M. C. trucks in this vicinity. L. E. Booth, manager of the Cincinnati branch, comes here from Rochester.

Increased Opportunities for Touring Abroad Seen Making American Cars Better Known

PARIS, May 12 (*by mail*)—With the placing in service next July of the steamer Ile de France the French Line will have facilities for carrying 160 unboxed automobiles as personal baggage on its various boats; 50 each on the Paris and the De Grasse, and 60 on the Ile de France. This service is quite distinct from ordinary freightage and is available only to passengers travelling with their cars.

Flat rates varying from $250 to $385, according to the weight of cars, for the round trip cover the cost from pier to pier, including all foreign documents, marine insurance up to $1000 and a triptyque enabling other countries to be visited without any more formality than the stamping of papers at the frontier station.

By courtesy of the French Government American motorists coming abroad with their cars are not required to undergo the practical driving examination, but are given a French license on proof that they are in possession of an American license. While this service is encouraged by the French Government, it also has the advantage of making American cars known throughout Europe than they are at the present time.

S. A. E. Speaker Says Wheel Alignment Should be Checked to Meet Local Needs

LOS ANGELES, May 21—Tire types and premature tire wear were the subjects that came in for detailed analysis at the final summer meeting of the Southern California Section, Society of Automotive Engineers. The principal speakers of the evening were Alvin N. Day of the Goodyear Tire & Rubber Co. of California, and J. S. Bushey, president of J. S. Bushey Co., Los Angeles, an authority on wheel operating efficiency. Mr. Day, with the aid of charts, explained the different types of tires best suited for different operating uses, and Mr. Bushey gave a detailed analysis of the reasons for imperfect tread wear.

Mr. Bushey's paper, which created wide discussion, brought out many illuminating points on wheel alignment.

"I would like to emphasize that premature tire wear, as caused by improper wheel alignment, is not a problem for the car manufacturer or tire manufacturer, but rather it is a service problem that must be handled at the point where the products sold are delivered for actual use.

"A car manufacturer whose factory, we will say, is located in Detroit, manufactures cars and ships them to all parts of this country and to other countries of the world. When the cars leave the manufacturer's plant, they may represent the acme of automotive engineering, and carry tires of unquestioned quality. But every car that is turned out at the factory is not going to operate on the same kind of road surface and under similar conditions, and for this reason tires that may yield their maximum expectancy of mileage on one car, will fall far short of that mark on another car.

"Paved roads, their construction and the materials used in their surfacing are elements which now vitally affect tire mileage. Various states have varying road specifications which force a consideration of local road conditions and their effect.

"It is my contention that every car, before it is placed in operation by the retail purchaser, should have its wheels carefully checked for perfect alignment to make certain that the weight of the car is distributed equally over the tires so they will roll properly over the road surfaces in the territory where the machine is to be driven.

Rain Halts Truck Sales in Kansas City District

KANSAS CITY, May 21—Truck sales in Kansas City and the territory served by the various factory branches here, are three to four weeks "behind schedule." Prospect lists of all dealers and branches are large and indications point to a good business as soon as weather conditions become more favorable. April and much of May was very rainy and virtually all contract work has been held up. Road work especially has been held up by weather conditions. New models being placed on the market by several companies also have had a tendency to create an unsettled state of mind among prospective buyers. This is especially true of fleet operators. In spite of these conditions sales are up with last year or a little ahead. Some of the dealers are reporting 30 to 100 per cent increases but most of the estimates are placed at 5 to 20 per cent with two or three companies reporting a loss over a year ago this time.

Indiana Sales Increase

INDIANAPOLIS, May 21—New car sales in Indiana during April scored a gain of 20 per cent over March but were 4 per cent below the mark established in April, 1926, according to registration statistics compiled by the Indianapolis Auto Trade Association. April, 1927, sales totaled 12,484. The total for the first four months of the present year was 37,295 against 32,295 for the same period last year, a gain this year of 16 per cent. For the first time, in April, Chevrolet passed Ford, Chevrolet being credited with 2997 new car sales against 2879 for Ford.

Kelly Back from Paris to Confer With Smith

NEW YORK, May 23—H. H. Kelly, Paris representative of the automotive division of the U. S. Department of Commerce, has returned to the United States for a series of conferences with H. O. Smith and other officers which are expected to result in some changes in the practice of the division. Under the proposed changes Mr. Kelly's activities in Europe may be greatly broadened. In addition to his active work for the division, Mr. Kelly is president of the American Automotive Club in Paris.

Monterey Sales Off 20%

WASHINGTON, May 21—Sales of automobiles in Monterey, Mexico, during 1926 were 20 per cent less than in 1925, the U. S. Department of Commerce has been advised. Higher priced cars were affected in greater proportion than the cheaper makes. No improvement is expected in the market until the general economic situation improves.

Employees Take Insurance

DETROIT, May 21—More than $1,000,000 in life insurance on the industrial group plan has been taken out by the employees of the Piston Ring Co. Policies run from $500 to $10,000.

Jordan Asserts Cars Put Money in Banks

Tells Oklahoma Bankers Automobile Main Factor in Increasing Prosperity

OKLAHOMA CITY, OKLA., May 21—The fact that dealers merely are supplying a demand for individual transportation that has been accumulating for 200 years explains the phenomenal rise of the automobile industry in the United States, Edward S. Jordan, president of the Jordan Motor Car Co., told the members of the Oklahoma Bankers here last week.

Mr. Jordan pointed out, that, although many bankers do not realize it, the automobile has done more for their business than any other single product of the nation.

"The automobile has enabled the laborer to widen his market, increase his wages, spend more money with the merchants and put more money in the bank, expanding business throughout the nation," Mr. Jordan said.

"When wages go up more money is put in the banks. More money is saved. People earning more money buy more. Merchants increase their business, put more money in the banks. The banks prosper with the prosperity of their community and 'blame' the automobile," he further said.

Perkins Machine Buys Springfield Body Plant

SPRINGFIELD, MASS., May 23—Perkins Machine & Gear Co., producers of a new multicut machine for the use of automobile manufacturers and various machinery concerns, has bought the land and buildings formerly belonging to the Springfield Body Corp. in West Springfield. The last-named concern has been for some time in bankruptcy and the property was acquired from the trustee for approximately $78,000.

The Perkins firm, which also manufactures gears in large quantities, will equip the plant for its purposes and occupy it as soon as possible. Large contracts are said to have been closed for the delivery of multicut machines, which up to the present have been made for the concern in a Cleveland factory. The concern, formerly the Perkins Appliance Co., was reorganized a few months ago with Julian L. Perkins president and A. W. Gilbert, president of the Chapman Valve Mfg. Co., as chairman of the board of directors.

Windsor to Show Plan

DETROIT, May 21—The Border Cities Dealer Association, of Windsor, is planning a big meeting in the near future for the benefit of dealer and manufacturing delegations interested in making a first-hand study of the used car plan now in use.

Steel Makers Adopt Lower Cost Process

Continuous Strip Mills Being Added to Permit Economies in Production

NEW YORK, May 26—Though there has been much fault found of late with prices obtained for those descriptions of finished steel that are chiefly bought by automotive consumers, productive capacity in these specialties is undergoing steady expansion. The leading interest is building one of the new types of continuous strip mills at its Gary plant. It is expected to go into production in October. Producers of both hot and cold-rolled strip steel have organized separate trade bodies to promote the interests of their respective memberships.

It looks as though a new alignment was about to take place, but it remains to be seen just what form it will take. The stronger sheet-rolling interests are adopting the continuous strip mill as additional equipment forced upon them by the economies of the new process. Some of the smaller mills, not so favorably situated financially, can ill-afford to follow suit. Moreover, the strip mill has its limitations, there being certain kinds of automotive stock that must be rolled on the sheet mill.

Up to the advent of the continuous strip mill, strip as well as sheet mills had a certain individuality, and, if competitive conditions lead to a change in this respect, the smaller producers face an uncharted market condition that naturally perplexes them. Whatever the condition resulting from the present state of flux may be, certain it is that productive capacity is being expanded. This is also certain to be the paramount influence in the price situation.

For the present automotive consumers are fairly well covered over the next month at old prices, and next week is likely to be considerably under the influence of Monday's holiday. Although close tonnage buyers are reported to have been able to obtain steel bars at as low as 1.80 cent, Pittsburgh, the market is more nearly on a 1.85 @ 1.90 cent basis. The same holds true of plates. Automotive alloy steels are steady and the movement is of a routine character.

Pig Iron—A temporary lull is noted in the foundry iron market. Nominally the market remains on an $18.50, valley basis.

Aluminum—The London market is reported to be unsettled as the result of heavy imports but so far no effect of this condition has been felt in the American market. Detroit consumers buy largely from hand to mouth. Automotive scrap production is somewhat larger than the industry's demand for remelted metal, thus providing a margin that tends to keep the market easy. Poland is reported to have joined the list of European aluminum producers as the result of the discovery of rich deposits of aluminum-bearing ores in that country.

Copper—The market continues weak. Consumers now are thought to have considerable reserve stocks, shipments to them during the first quarter having considerably exceeded their consumptive requirements. When producers want to sell they have to offer inducements. Demand for automotive brasses is fair.

Tin—According to the National Automobile Chamber of Commerce, 1926 tin consumption in automobiles ran 7½ lb. per car, an increase of 1 lb. per car over the 1925 figures of that authority, and representing 19 per cent of the total tin consumption. The market is steady.

Canada to Expend $3,892,233 for Planes

WASHINGTON, May 26—The Canadian Parliament has authorized expenditure of $3,892,233 for an aviation program, of which $1,669,694 will be spent for military training and operation and $2,222,539 for civil government operation and civil aviation, the U. S. Department of Commerce was advised this week. Forest and survey services for the various branches of the government are provided for and four new modern fighting planes will be provided for the military air staff.

Twenty Submit Designs for New Navy Dirigible

WASHINGTON, May 25—Twenty designs have been submitted in the Navy's competition for plans for its new $5,000,000 super-dirigible. A special board of naval experts will select the design and award the $50,000 prize to the winner. The board's decision will be announced about the end of June.

A number of the designs will be thrown out because they fail to meet the rules governing the contest, it was announced. Several foreign concerns submitted plans.

April Excise $6,440,345

WASHINGTON, May 25—Collection of internal revenue taxes on automobiles and motorcycles during the month of April totaled $6,440,345 as compared with $10,094,915 for April, 1926, the reduction being due to the reduction of the tax from 5 to 3 per cent, the Internal Revenue Bureau announced here this week.

Total taxes on automobiles and motorcycles for the first 10 months of the present fiscal year totaled $53,361,567 as compared with $98,199,079 for the same period of the previous fiscal year. a decrease of $44,837,511.

Financial Notes

Hood Rubber Co. reports net loss of $1,282,473 after charges for the year ended March 31, 1927. After payment of $1,196,329 in dividends the deficit for the year was $2,478,802. The net working capital of March 31 was $18,482,958 against $14,615,399 a year earlier, the increase reflecting new financing as of last October. Tires comprised 39 per cent of the output.

Mullins Body Corp. for quarter ended March 31, 1926, shows net profit of $129,821 after interest and Federal taxes, equivalent after allowing for 8 per cent preferred dividends to $1.10 a share earned on 100,000 shares of no par common stock, comparing with $92,376 or 73 cents a share in first quarter of 1926.

Manufacturers Aircraft Loses in Royalty Claim

WASHINGTON, May 26—Claims of the Manufacturers Aircraft Association, Inc., New York, for $141,800 on account of patent royalties for use by the War Department of aircraft patents were disallowed this week by the comptroller general of the United States.

The comptroller general ruled that an arrangement between the association and patentees providing for distribution of royalties cannot require the United States to pay royalties greater in amount than agreed.

There has already been paid as royalty during the war $2,094,000 or $94,600 in excess of a proper interpretation of the terms of agreement, arising from the procedure of allowing 12½ per cent to the Manufacturers Aircraft Association before application of the payments to the $2,000,000 limitation, the comptroller general held.

Couzens Appeal Decision to Come by Mid-Summer

WASHINGTON, May 25—Final oral arguments in the $30,000,000 Couzens-Dodge tax appeal case were begun here this week before the U. S. Board of Tax Appeals. Taxpayers and the government have been allotted seven hours each. Final decision is not expected before the middle of the summer.

In opening the argument for the Ford Motor Co. minority stockholders, Joseph Davies, who with John W. Davis, represents the defense, declared that the government acted in bad faith.

Pan-American Delegate Killed by Car in Akron

WASHINGTON, May 25 — Jose Bravo, of Lima, Peru, a delegate to the Pan-American commercial conference and president of the Pan-American standardization conference, was run down and killed by an automobile at Akron, the Pan-American Union has been advised. Senor Bravo was making a highway tour of the Middle West in company with other delegates.

California to Seek Uniform Traffic Law

State-Wide Conference Endorses Measure as Aiding Public Safety Work

BERKELEY, CAL., May 24—The state-wide traffic conference held in Berkeley the week ending May 21, endorsed three major features of the public safety campaign being carried on by the California State Automobile Association and the Automobile Club of southern California. The conference was held under the auspices of the California Public Safety Conference, the Berkeley Traffic Commission and the California Development Association. It was attended by traffic and safety experts from every section of the state, and had as visitors a number of others from Pacific Slope states outside California.

The three features endorsed are the uniform traffic ordinance, the public school traffic reserve system, and the visual education of school children in traffic safety through display and discussion of posters in classrooms in every public school in the state. The conference adopted a report presented by Walter Bachrodt, superintendent of schools at San Jose, urging a general safety education campaign in public schools. In this report, the 8000 public safety posters, placed by the California State Automobile Association in as many public school classrooms, were endorsed as effective.

The traffic reserve plan, insuring safe conduct of children to and from school, was praised and both activities incorporated in the plan of juvenile education in traffic safety endorsed by the conference. Units of boy traffic officers are now in operation on routes to and from schools in 16 northern and central California cities, and the work is being extended rapidly to other cities and towns.

To Draft New Ordinances

The conference also adopted a resolution approving the uniform traffic ordinance recommended for all California cities by the two organizations of motorists, and instructed delegates to work for the adoption of this standardized code in every city of the state. City attorneys were urged to confer at once with the attorneys of the two automobile associations on proposed city ordinances so that uniformity may be maintained. Uniformity of interpretation and application of the law also was recommended.

Plans for adult education in traffic safety were approved, and methods of coordinating all public safety activities in California presented to the conference. Hollis H. Thompson, president of the Berkeley Traffic Commission, occupied the chair during the sessions.

Pioneer Limited Now on Bearings

DETROIT, May 21—The Pioneer Limited of The Chicago, Milwaukee & St. Paul Railroad, the first complete train equipped with tapered roller bearings, was scheduled to go into service today. The train will operate between Chicago and Minneapolis. Guests on the initial run were to include H. H. Timken, president, and W. C. Sanderson, manager of the railway division of the Timken Roller Bearing Co., which manufactured the equipment.

Federal-Mogul in New Plant Building

DETROIT, May 23—Federal Mogul Corp. is now moving into a large new addition to its plant No. 1 and expects to get into production there before June 1. The new plant is in accordance with the consolidation and expansion program of the company which is designed to broaden the service of the company and make production improvements and economies possible. Sales of the company are reported to have practically doubled in the past three years.

The new addition with changes in the equipment of plants No. 1 and 2 will make possible largely increased output. The new space will be used principally to house the engineering department and will provide larger production facilities for the manufacture of close limit interchangeable bearings, the demand for which it reports increased. The company has been operating a full day and night force throughout April and May.

First quarter production of the company totaled 4,150,000 units as compared with 3,750,000 in the same period of 1926 and 2,500,000 in the 1925 first quarter.

The company has recently added a research engineering department.

Strom Increases Capacity

CHICAGO, May 23—Strom Steel Ball Co. is now in full operation in its new plant at Cicero, a Chicago suburb. The new plant affords an increase of approximately 75 per cent in its manufacturing capacity. The equipment of the new plant includes a large number of machines specially developed by the company.

Graham Sales 5600 in April

DETROIT, May 21—Retail sales of Graham Brothers units in the United States and abroad totaled 5600 units in April. Of this number 1084 were for overseas shipment, which was an increase of 188 per cent over March.

Moon Closes Out Factory Branches

Expense of Liquidations and War Claim Payment Causes Loss in 1926

ST. LOUIS, May 23—Moon Motor Car Co. showed a net profit of $125,421 for the year 1926, but during the latter part of the year, due to liquidation of several subsidiary companies and compulsory payment of an old war claim in which the government demanded the immediate payment of approximately a half million dollars, but which was settled for less, this profit was eliminated and a deficit for the year is shown. In addition, the company was burdened with the expense of the development of a new light six-cylinder car which did not get into production until the latter part of the year.

The charges referred to are all of non-recurring character and the company has now returned to merchandising its cars through distributors and dealers instead of maintaining branches in several of the larger cities which were closed.

Since the first of the year 57 new distributors and dealers have been added in this country and 12 abroad. The Moon company has always enjoyed a substantial export business; in fact, this constitutes 12 per cent of its total volume. The month of April just closed shows a net gain in this particular department of almost 100 per cent over the same month a year ago.

The consolidated balance sheet shows the company's net worth on Dec. 31, 1926, to be $1,904,432.

Perfect Circle Adopts New Standard Marking

HAGERSTOWN, IND., May 23—The Perfect Circle Co. is now marking all standard size piston rings "Standard to .002½ Oversize." In explaining the change the Perfect Circle company calls attention to the fact that no manufacturer makes rings to a diametric tolerance of less than .002½ of an inch. Therefore, rings thus marked may be no larger than a great many standard rings, and many standards are as large as rings marked .002½ oversize. The adoption of the marking has been commended by the Society of Automotive Engineers as conforming with efforts to eliminate unnecessary sizes through standardization.

Germany Continues Tax

WASHINGTON, May 24—The 25 per cent surtax added to German automobile tax rates will remain in effect for the fiscal year 1927, from April 1 to March 31, 1928, the U. S. Department of Commerce was notified. The German Ministry of Finance has just published a decree dated Feb. 28, 1927, authorizing the continuation of the tax.

Montreal License Plan Hits Accessory Thefts

MONTREAL, May 21—In an effort to halt the stealing of automobile parts, the civic administration of Montreal, Canada's largest city, has adopted a by-law which prohibits the purchase or sale of any automobile part except from or by automobile or parts manufacturers or regularly constituted automobile supply houses. The enactment is designed to discourage "fences," second-hand dealers, phoney wreckers and junk shops from dealing in new or used parts or accessories which might have been stolen or lost.

Sales of accessories are to be registered by the Montreal police department unless the dealer is regularly in the automobile or manufacturing business. Penalties up to $40 and imprisonment up to two months are provided for in the new statute.

The stealing of motometers, tires, ornaments, headlights, wheels and other parts of automobiles had become a serious problem in Montreal but it is expected that the new lay will throw the accessory business into legitimate channels.

Starrett Adds New Tools

ATHOL, MASS., May 23—The L. S. Starrett Co. is making numerous additions to its list of precision tools, with special regard to the needs of automobile maintenance and repair shops. This action is based on the conviction that the policy of the future will be directed to reconditioning of cars rather than frequent purchases of new cars. A new V-edge protractor for checking perpendicular alignment of cylinders, a new micrometer caliper and various new gages are among the new items.

Coming Feature Issues of Chilton Class Journal Publications

June 4—Automotive Industries —Engineering Number.

June 10—Motor World Wholesale—A.E.A. Summer Meeting Number.

Rice Praises Ad Clubs for Improving Ethics

DETROIT, May 21—H. H. Rice, assistant to the president of General Motors Corp., addressed the Detroit Adcraft Club, yesterday. The instalment plan is a blessing, he said, in that it keeps men at work and they do not have time to become disgruntled and consequently work harder to meet payments on purchases that make living better for their families.

The advertising men have an opportunity to raise business ethics, he said, for in their hands lies the medium of communication to the public. In this connection the advertising clubs and better business bureaus were praised for improving business ethics throughout the country.

Hudson Reelects Officers

DETROIT, May 21—The regular quarterly dividend of 87½ cents a share payable July 1 to stock of record June 11 was declared at the annual meeting of the Hudson Motor Car Co., held yesterday. All directors of the company were reelected and at a subsequent meeting of the directors all officers were reelected for the coming year.

Motorcycle Grand Prize to be Staged in Germany

NEW YORK, May 23—A grand prize of Europe race for motorcycles will be held July 2 and 3 on the Nurburg Ring, a new racing track located about 40 miles southwest of Cologne, Germany. The event will be conducted under the rules of the Federation Internationale des Clubs Motocyclists. There will be races for six classes, of 10.68, 15.25, 21.40, 30.50, 45.75 and 61 cu. in. displacement, respectively. For the first three classes the distances will be 246, 264 and 281 miles, while for the last three it will be 316 miles. The first three classes will race on the first day, the other three on the second. Cash prizes of 1500, 1000 and 500 marks are offered for the first three to finish in each class. The competitor making the best time and complying with the rules will be awarded the gold medal known as the Grand Prize of Europe. The race is under the management of the Deutsche Motorad-Sportgemeinschaft, 118 Kurfurstendamm, Berlin 62.

Gordon Company to Build

COLUMBUS, May 21—The J. P. Gordon Co. has purchased a large tract of land where it will erect a five-story reinforced concrete factory. The structure will be 250 by 180 ft. and will be modern throughout. The company has outgrown its present factory. Preliminary sketches for the new factory are being made and actual work will probably be started later in the year. The J. P. Gordon Co., operated formerly under the name of the Vehicle Apron & Hood Co., is one of the oldest and largest concerns making tire covers and seat covers.

Calendar of Coming Events

SHOWS

Budapest .....June 4-15
Chicago .....Nov. 7-12
Exposition, Coliseum, Automotive Equipment Association.
Chicago .....Jan. 28-Feb. 4
National, Coliseum, National Automobile Chamber of Commerce, including special Shop Equipment Exhibit.
Chicago .....Jan. 28-Feb. 4
Automobile Salon.
Cleveland .....Sept. 19-23
Exposition, Public Auditorium, National Machine Tool Builders' Assn.
Cleveland .....Oct. 3-7
Exhibition, Public Auditorium, American Electric Railway Ass'n.
Cleveland .....Nov. 14-19
Convention Hall, National Standard Parts Association.
Cleveland .....Jan. 9-14
American Road Builders Association.
Cologne .....May 20-31
International Commercial Transport Exhibition.
London .....Oct. 14-22
Olympia Passenger Car Show.
London .....Nov. 17-26
Olympia Truck Show.
Los Angeles .....Feb. 11-18
Automobile Salon.
New Haven, Conn. .....Sept. 6-9
Machine Tool Exhibition.
New York .....Nov. 27-Dec. 3
Automobile Salon.
New York .....Jan. 7-14
National, Grand Central Palace, National Automobile Chamber of Commerce, including special Shop Equipment Exhibit.
Paris .....Oct. 6-16
Grand Palais.
Prague .....June 4-16
International Aeronautical Exhibition.
San Francisco .....Feb. 25-March 3
Automobile Salon.

CONVENTIONS

American Automobile Association, Bus Division Meeting, Ritz-Carlton, Philadelphia .....June 15-16
American Automobile Association, Annual Meeting, Ritz-Carlton Hotel, Philadelphia .....June 16-17
American Electric Railway Association, Public Auditorium, Cleveland..Oct. 3-7
American Society for Steel Treating, Convention Hall, Detroit....Sept. 19-24
Automotive Equipment Association Summer Convention, Multnomah Hotel, Portland, Ore...June 27-July 2
Automotive Equipment Association, Coliseum, Chicago .....Nov. 7-12
Bureau Permanent, Paris .....June 18
International Chamber of Commerce, Stockholm .....June 27-July 2
National Association of Automobile Show and Association Managers, Drake Hotel, Chicago .....July 28-29
National Association of Credit Men, Brown Hotel, Louisville, Ky...June 6-10
National Safety Council, Stevens Hotel, Chicago .....Sept. 26-30
National Standard Parts Association, Hotel Hollenden, Cleveland..Nov. 14-19
United States Good Roads Association, Savannah, Ga. .....June 6-11

N. A. C. C.

Cleveland, June 14-15—Factory Service Managers Forum, Hotel Statler.
New York, May 31—Truck Members Meeting.
New York, June 2—Annual Meeting.

S. A. E.

National

Chicago, November—National Transportation and Service Meeting.
Chicago, Dec. 1—Tractor Meeting.
Cleveland and Detroit, Sept. 19-22—Production Meeting.

RACES

Abilene, Texas .....July 4
Altoona, Pa. .....June 11
Altoona, Pa. .....Sept. 5
Atlantic City .....Sept. 24
Belgian Grand Prix, Spa-Francorchamps .....July 9-10
British Grand Prix, Brooklands.....Oct. 1
Charlotte, N. C. .....Oct.
Detroit .....Sept. 10
French Grand Prix, Montlhery.....July 3
Indianapolis .....May 30
Los Angeles .....Nov. 27
Salem, N. H. .....June 25
Salem, N. H. .....Oct. 12
Syracuse, N. Y. .....Sept. 3